FINAL PROPOSED RULE # 17-P10

Administrative Procedures – Final Proposed Rule Coversheet

Instructions:

In accordance with Title 3 Chapter 25 of the Vermont Statutes Annotated and the "Rule on Rulemaking" adopted by the Office of the Secretary of State, this final proposed filing will be considered complete upon the submission and acceptance of the following components to the Office of the Secretary of State and to the Legislative Committee on Administrative Rules:

RECEIVED
MAY 16 2017
BY: .....

- Final Proposed Rule Coversheet
- Adopting Page
- Economic Impact Statement
- Public Input Statement
- Scientific Information Statement (if applicable)
- Incorporated by Reference Statement (if applicable)
- Clean text of the rule (Amended text without annotation)
- Annotated text (Clearly marking changes from previous rule)
- Copy of ICAR acceptance e-mail
- A copy of comments received during the Public Notice and Comment Period.
- Responsiveness Summary (detailing agency's decisions to reject or adopt suggested changes received as public comment).

All forms submitted to the Office of the Secretary of State, requiring a signature shall be hand signed original signatures of the appropriate adopting authority or authorized person, and all filings are to be submitted, no later than 3:30 pm on the last scheduled day of the work week.

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I approve the contents of this filing entitled:

Rule Title: Rule on Sound Levels from Wind Generation Facilities

_____, on 5/16/2017.
(signature) (date)

Printed Name and Title:
James Volz, Chair, Vermont Public Service Board

RECEIVED BY: _____

RECEIVED
MAY 16 2017
BY: .....

- ☐ Final Proposed Rule Coversheet
- ☐ Adopting Page
- ☐ Economic Impact Statement
- ☐ Public Input Statement
- ☐ Scientific Information Statement (if applicable)
- ☐ Incorporated by Reference Statement (if applicable)
- ☐ Clean text of the rule (Amended text without annotation)
- ☐ Annotated text (Clearly marking changes from previous rule)
- ☐ ICAR Approval received by E-mail.
- ☐ Copy of Comments
- ☐ Responsiveness Summary

1. TITLE OF RULE FILING:
   Rule on Sound Levels from Wind Generation Facilities
2. PROPOSED NUMBER ASSIGNED BY THE SECRETARY OF STATE
   17P-010
3. ADOPTING AGENCY:
   Public Service Board
4. PRIMARY CONTACT PERSON:
   (A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE).

   Name: Thomas Knauer

   Agency: Public Service Board

   Mailing Address: 112 State St., 4th Floor, Montpelier, VT 05602

   Telephone: 802 828 - 2358 Fax: -

   E-Mail: thomas.knauer@vermont.gov

   Web URL *(WHERE THE RULE WILL BE POSTED)*:
   http://psb.vermont.gov/about-us/statutes-and-rules/proposed-rule-sound-wind-generation-facilities
5. SECONDARY CONTACT PERSON:
   (A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON).

   Name: Kevin Fink

   Agency: Public Service Board

   Mailing Address: 112 State St., 4th Floor, Montpelier, VT 05602

   Telephone: 802 828 - 2358 Fax: -

   E-Mail: kevin.fink@vermont.gov
6. RECORDS EXEMPTION INCLUDED WITHIN RULE:
   (DOES THE RULE CONTAIN ANY PROVISION DESIGNATING INFORMATION AS CONFIDENTIAL; LIMITING ITS PUBLIC RELEASE; OR OTHERWISE EXEMPTING IT FROM INSPECTION AND COPYING?) No

   IF YES, CITE THE STATUTORY AUTHORITY FOR THE EXEMPTION:

   PLEASE SUMMARIZE THE REASON FOR THE EXEMPTION:
7. LEGAL AUTHORITY / ENABLING LEGISLATION:

(THE SPECIFIC STATUTORY OR LEGAL CITATION FROM SESSION LAW INDICATING WHO THE ADOPTING ENTITY IS AND THUS WHO THE SIGNATORY SHOULD BE. THIS SHOULD BE A SPECIFIC CITATION NOT A CHAPTER CITATION).

Section 12(a) of Act 174 of 2016; 30 V.S.A. § 248; 30 V.S.A. § 3

8. THE FILING HAS CHANGED SINCE THE FILING OF THE PROPOSED RULE.

9. THE AGENCY HAS INCLUDED WITH THIS FILING A LETTER EXPLAINING IN DETAIL WHAT CHANGES WERE MADE, CITING CHAPTER AND SECTION WHERE APPLICABLE.

10. SUBSTANTIAL ARGUMENTS AND CONSIDERATIONS WERE RAISED FOR OR AGAINST THE ORIGINAL PROPOSAL.

11. THE AGENCY HAS INCLUDED COPIES OF ALL WRITTEN SUBMISSIONS AND SYNOPSES OF ORAL COMMENTS RECEIVED.

12. THE AGENCY HAS INCLUDED A LETTER EXPLAINING IN DETAIL THE REASONS FOR THE AGENCY'S DECISION TO REJECT OR ADOPT THEM.

13. CONCISE SUMMARY **(150 WORDS OR LESS)**:
The rule establishes a sound level limit at nearby non-participating residences that wind generation facilities must meet. In addition, the rule defines standards for how to model sound impacts during the permitting process and compliance methodologies to monitor and analyze sound levels from a wind generation facility after construction.

14. EXPLANATION OF WHY THE RULE IS NECESSARY:
Adoption of a rule regulating sound from wind generation facilities is required by Section 12(a) of Act 174 of 2016.

15. LIST OF PEOPLE, ENTERPRISES AND GOVERNMENT ENTITIES AFFECTED BY THIS RULE:
Vermont wind generation facility developers
Prospective neighbors of wind generation projects
Prospective host towns of wind generation projects
Vermont regional planning commissions
Vermont Department of Public Service
Vermont Department of Health
Vermont Agency of Natural Resources

16. BRIEF SUMMARY OF ECONOMIC IMPACT(150 WORDS OR LESS):
The rule will impose costs on developers seeking to develop a wind generation facility, who will be required to provide a model of the sound impacts of a proposed facility and will be required to pay for compliance testing following construction. In addition, the rule may have indirect impacts due to potential limitations on the number of sites where it may be possible to host a facility under the rule.

17. A HEARING WAS HELD.

18. HEARING INFORMATION
(THE FIRST HEARING SHALL BE NO SOONER THAN 30 DAYS FOLLOWING THE POSTING OF NOTICES ONLINE).

IF THIS FORM IS INSUFFICIENT TO LIST THE INFORMATION FOR EACH HEARING PLEASE ATTACH A SEPARATE SHEET TO COMPLETE THE HEARING INFORMATION.

Date: 5/1/2017
Time: 07:00 PM
Street Address: Bennington Fire Facility, 130 River Street, Bennington, VT
Zip Code: 05201

Date: 5/2/2017
Time: 07:00 PM
Street Address: Lowell Graded School, 52 Gelo Park Rd, Lowell, VT
Zip Code: 05847

Date: 5/4/2017
Time: 09:30 AM
Street Address: 112 State Street Montpelier, VT
Zip Code: 05602

Date: 5/4/2017
Time: 07:00 PM
Street Address: Montpelier High School, 5 High School Drive Montpelier, VT
Zip Code: 05602

Date:

Time: AM
Street Address:
Zip Code:

Date:
Time: AM
Street Address:
Zip Code:

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19. DEADLINE FOR COMMENT (NO EARLIER THAN 7 DAYS FOLLOWING LAST HEARING):
5/11/2017

20. KEYWORDS (PLEASE PROVIDE AT LEAST 3 KEYWORDS OR PHRASES TO AID IN THE SEARCHABILITY OF THE RULE NOTICE ONLINE).
Wind
Electric generation
Noise
Sound

112 State Street
4th Floor
Montpelier, VT 05620-2701
TEL: 802-828-2358

TTY/TDD (VT: 800-253-0191)
FAX: 802-828-3351
E-mail: psb.clerk@vermont.gov
Internet: http://psb.vermont.gov

State of Vermont
Public Service Board
MEMORANDUM

To: Members of the Legislative Committee on Administrative Rules

From: Kevin Fink, Policy Analyst, Vermont Public Service Board

Date: May 16, 2017

Subject: Final Proposed Rule Entitled "Rule on Sound Levels from Wind Generation Facilities"

Due to the lengthy content and technical nature of a number of the standards incorporated by reference in the Public Service Board ("Board") proposed rule entitled "Rule on Sound Levels from Wind Generation Facilities," the Board has not included copies of each of the incorporated standards for each member of the committee. In lieu of such inclusion, a description of the standards proposed to be incorporated is provided below. In addition, the Board is happy to provide a copy of the text of the standards if needed.

ISO 9613-2:1996: ISO 9613-2 provides a methodology for modeling the attenuation of sound from a source in order to predict sound levels at various distances from that source.

ANSI S1.13, Annex A: This standard provides a measurement protocol used to identify whether a sound results in prominent discrete-frequency tones.

IEC 61400-11: This standard prescribes measurement procedures that standardize the process for measuring the sound power level of a wind turbine at the source.

American National Standard Specifications for Sound Level Meters, ANSI S1.4: This standard sets requirements for the accuracy of sound level meters used in sound monitoring.

IEC 61672-1: This standard establishes performance specifications for sound level meters.

American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters, ANSI S1.11: This standard establishes requirements for measuring the tonal quality of sound using filters within specified frequencies.

IEC 61260: This standard prescribes requirements for the periodic testing of octave-band and fractional-octave-band filters used to measure the tonal quality of sound.

American National Standard Specification for Acoustical Calibrators, ANSI S1.40: This standard prescribes performance requirements for acoustical calibrators used to confirm the accuracy of acoustical measurement instruments.

ISO 1996-2: This standard provides a methodology for determining sound pressure levels at a site, including a methodology for measuring the tonal quality of sounds and incorporating assessments of tonality into an overall sound level measurement.

Vermont Department of Public Service Protocol for Handling Complaints about a Violation of the Terms and Conditions of a Certificate of Public Good: This protocol adopted by the Vermont Department of Public Service ("Department") establishes a procedure that the Department uses to investigate complaints of violations of a certificate of public good ("CPG"), including procedures that CPG holders are required to abide by when handling complaints.

Administrative Procedures – Adopting Page

Instructions:

This form must be completed for each filing made during the rulemaking process:

- Proposed Rule Filing
- Final Proposed Filing
- Adopted Rule Filing
- Emergency Rule Filing

Note: To satisfy the requirement for an annotated text, an agency must submit the entire rule in annotated form with proposed and final proposed filings. Filing an annotated paragraph or page of a larger rule is not sufficient. Annotation must clearly show the changes to the rule.

When possible the agency shall file the annotated text, using the appropriate page or pages from the Code of Vermont Rules as a basis for the annotated version. New rules need not be accompanied by an annotated text.

1. TITLE OF RULE FILING:
   Rule on Sound Levels from Wind Generation Facilities
2. ADOPTING AGENCY:
   Public Service Board
3. AGENCY REFERENCE NUMBER, IF ANY:
   5.700
4. TYPE OF FILING (*PLEASE CHOOSE THE TYPE OF FILING FROM THE DROPDOWN MENU BASED ON THE DEFINITIONS PROVIDED BELOW*):

   - **AMENDMENT** - Any change to an already existing rule, even if it is a complete rewrite of the rule, it is considered an amendment as long as the rule is replaced with other text.
   - **NEW RULE** - A rule that did not previously exist even under a different name.
   - **REPEAL** - The removal of a rule in its entirety, without replacing it with other text.

   This filing is **AN AMENDMENT OF AN EXISTING RULE** .

5. LAST ADOPTED (*PLEASE PROVIDE THE SOS LOG#, TITLE AND LAST DATE OF ADOPTION FOR THE EXISTING RULE*):

   16-E05; Temporary Rule on Sound Levels from Wind Generation Facilities; 7/28/16

State of Vermont
Agency of Administration
109 State Street
Montpelier, VT 05609-0201
www.aoa.vermont.gov

[phone] 802-828-3322
[fax] 802-828-3320

Office of the Secretary

INTERAGENCY COMMITTEE ON ADMINISTRATIVE RULES

To: Louise Corliss, SOS
Chris Winters, SOS
Charlene Dindo, LCAR
ICAR Members

Date: March 14, 2017

Proposed Rule: Rule on Sound Levels from Wind General Facilities
(Public Service Board)

The following official action was taken at the March 13, 2017 meeting of ICAR.

Present: Chair Brad Ferland, Dirk Anderson, Diane Bothfeld, Allan Sullivan, and John Kessler
Absent: Karen Songhurst – voted electronically
Jen Duggan – voted electronically
Steve Knudson – voted electronically
Clare O'Shaughnessy

[ ] The Committee has no objection to the proposed rule being filed with the Secretary of State.

[X] The Committee approves the rule with the following recommendations.

1. Committee suggested the Public Service Board (PSB) determine whether the current temporary rule sunsets on June 30th, which would impact the timeline of the proposed rule.
2. Coversheet #12: Committee discussed hearing information and location. PSB explained the morning and evening hearing on the same day and that written comments are also welcome. The Committee questioned whether other locations should be considered.
3. Economic Impact Statement #5: Add additional information in this section regarding the data and give examples of range of costs as well as environmental impact costs.
4. Economic Impact Statement #6 last paragraph: To be consistent, correct spelling of modeling.
5. Public Input Statement: Define VPIRG.
6. Scientific Information Statement #4: If available, provide an active hyperlink.
7. Incorporation by Reference Statement #3 and #6: Correct spelling of calibrating.
8. In rule, Section 5.702 (K): Define dB.

[ ] The Committee opposes filing of the proposed rule.

cc: Thomas Knauer
Kevin Fink

Administrative Procedures – Economic Impact Statement

Instructions:

In completing the economic impact statement, an agency analyzes and evaluates the anticipated costs and benefits to be expected from adoption of the rule. This form must be completed for the following filings made during the rulemaking process:

- Proposed Rule Filing
- Final Proposed Filing
- Adopted Rule Filing
- Emergency Rule Filing

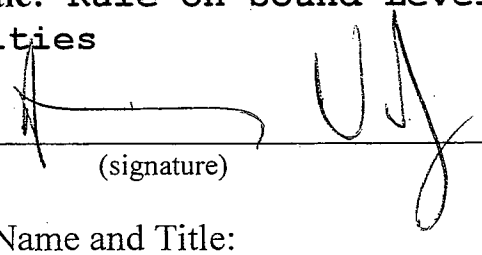
Rules affecting or regulating public education and public schools must include cost implications to local school districts and taxpayers in the impact statement (see 3 V.S.A. § 832b for details).

The economic impact statement also contains a section relating to the impact of the rule on greenhouse gases. Agencies are required to explain how the rule has been crafted to reduce the extent to which greenhouse gases are emitted (see 3 V.S.A. § 838(c)(4) for details).

All forms requiring a signature shall be original signatures of the appropriate adopting authority or authorized person.

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I conclude that this rule is the most appropriate method of achieving the regulatory purpose. In support of this conclusion I have attached all findings required by 3 V.S.A. §§ 832a, 832b, and 838(c) for the filing of the rule entitled:

Rule Title: Rule on Sound Levels from Wind Generation Facilities



_____, on 5/16/2017.
(signature) (date)

Printed Name and Title:
James Volz, Chair, Vermont Public Service Board

BE AS SPECIFIC AS POSSIBLE IN THE COMPLETION OF THIS FORM, GIVING FULL INFORMATION ON YOUR ASSUMPTIONS, DATABASES, AND ATTEMPTS TO GATHER OTHER INFORMATION ON THE NATURE OF THE COSTS AND BENEFITS INVOLVED. COSTS AND BENEFITS CAN INCLUDE ANY TANGIBLE OR INTANGIBLE ENTITIES OR FORCES WHICH WILL MAKE AN IMPACT ON LIFE WITHOUT THIS RULE.

1. TITLE OF RULE FILING:

   Rule on Sound Levels from Wind Generation Facilities

2. ADOPTING AGENCY:

   Public Service Board

3. CATEGORY OF AFFECTED PARTIES:

   LIST CATEGORIES OF PEOPLE, ENTERPRISES, AND GOVERNMENTAL ENTITIES POTENTIALLY AFFECTED BY THE ADOPTION OF THIS RULE AND THE ESTIMATED COSTS AND BENEFITS ANTICIPATED:

   Vermont wind generation facility developers

   Prospective neighbors of wind generation projects

   Prospective host towns of wind generation projects

   Vermont regional planning commissions

   Vermont Department of Public Service

   Vermont Department of Health

   Vermont Agency of Natural Resources

4. IMPACT ON SCHOOLS:

   INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON PUBLIC EDUCATION, PUBLIC SCHOOLS, LOCAL SCHOOL DISTRICTS AND/OR TAXPAYERS:

   The rule is not expected to have any effect on schools.

5. COMPARISON:

   COMPARE THE ECONOMIC IMPACT OF THE RULE WITH THE ECONOMIC IMPACT OF OTHER ALTERNATIVES TO THE RULE, INCLUDING NO RULE ON THE SUBJECT OR A RULE HAVING SEPARATE REQUIREMENTS FOR SMALL BUSINESS:

   In developing the final proposed rule, the Board considered several alternative approaches. First, the Board considered a simple setback requirement that would require turbines to be installed a minimum distance from neighboring residences. Although this approach nearly eliminates compliance costs, the setback distance necessary to consistently achieve the

appropriate sound levels would need to be unduly restrictive in order to ensure compliance under all circumstances. Given the varied nature of Vermont's terrain and its impact on sound attenuation, a distance requirement sufficient to consistently ensure compliance with the levels of the final proposed rule could exclude facilities that may otherwise present acceptable impacts. Thus, in certain circumstances, the economic benefit of wind generation turbines would not be realized.

The Board also considered the possibility of setting interior sound limits, as provided for in prior Certificates of Public Good for wind facilities issued by the Board. Although directly tied to the public policy goal of minimizing sleep disturbance, interior sound limits present significant complications for modeling, monitoring, and enforcement that the Board determined did not justify their inclusion in the rule. In lieu of establishing an interior limit, the Board set an outdoor sound limit that provides that targeted interior levels will be reached in the majority of cases.

In the initial proposed rule, the Board proposed a compliance verification methodology that sought to avoid separately accounting for and subtracting ambient sound levels in order to determine the sound level of a wind generation facility by only conducting monitoring under conditions where the contribution from other sound sources was minimal. The Board initially believed that this proposal had the potential cost advantages of avoiding economic losses associated with periodic turbine shutdowns for monitoring, as well as reducing the amount of expensive data analysis required to assess turbine-only sound levels. However, based on recommendations received during the public comment phase, the Board determined that this approach may not consistently result in sound level data appropriate for use in compliance determinations, particularly in areas with higher background sound levels. In addition, commenters presented evidence that, in certain cases, extended monitoring would be necessary to capture conditions in which this methodology is effective,

resulting in higher costs. In light of these comments, the Board has adopted a sound monitoring methodology that requires turbine shutdowns to measure and subtract ambient sound levels from the sound levels recorded while the turbines are in operation.

Because adoption of a rule was required by statute, the Board did not compare various proposals against the possibility of having no rule on the subject.

6. FLEXIBILITY STATEMENT:

COMPARE THE BURDEN IMPOSED ON SMALL BUSINESS BY COMPLIANCE WITH THE RULE TO THE BURDEN WHICH WOULD BE IMPOSED BY ALTERNATIVES CONSIDERED IN 3 V.S.A. § 832a:

In light of the significant capital costs associated with installing large-scale wind generation facilities, the development of such projects is not typically undertaken by small businesses. However, many small businesses do engage in the development of smaller wind projects.

As initially proposed, the rule treated large and small wind projects similarly, but would have allowed smaller projects to avoid the requirements for monitoring by meeting a minimum setback distance from neighboring non-participating residences. In response to comments, the Board revised the rule to treat the smallest wind projects in a more distinct manner that better reflects both their potential impacts and the proportionally more significant costs of sound modeling and monitoring. As a result, the final proposed rule incorporates a distinct standard for projects under 50 kW of capacity that provides overall limits on sound but allows for occasional exceedances during periods of high wind speeds. This standard provides substantially greater flexibility to small projects. In addition, for those facilities using turbines certified by the Small Wind Certification Council ("SWCC"), the Board has allowed for simplified analysis of anticipated sound levels in the permitting phase. Under the final proposed rule, such projects will only be required to file a copy of their certification documents provided by the SWCC, information on the distance to the nearest

residences, and a simplified sound attenuation calculation.

In addition to the modified requirements for wind turbines with a capacity of 50 kW or less described above, the Board also retained the setback-based alternative to compliance monitoring for facilities with a capacity greater than 50 kW and up to and including 150 kW. Under this standard, facilities in this class may avoid compliance monitoring requirements by locating turbines a minimum distance from non-participating neighboring residences. Thus, facilities in this class may avoid costly monitoring requirements if they are able to site the project a minimum distance from residences or reach agreements with neighbors.

In addition, the Board determined not to apply the separate nighttime sound requirements applicable to large turbines to facilities in either of the smaller classes due to the absence of noise reduction operation technologies for these turbines.

The Board also considered a further alternative for small wind facilities proposed by commenters. Under this alternative, the Board would have applied a higher sound level limit to smaller turbines than that applied to larger turbines. The Board did not adopt this approach because it believes that the approach it has adopted provides for greater flexibility for small turbines and, by aligning the compliance standard with the most common certification standard for small turbines, simplifies the compliance demonstration requirements for certified turbines in the permitting phase.

7. GREENHOUSE GAS IMPACT: *EXPLAIN HOW THE RULE WAS CRAFTED TO REDUCE THE EXTENT TO WHICH GREENHOUSE GASES ARE EMITTED, EITHER DIRECTLY OR INDIRECTLY, FROM THE FOLLOWING SECTORS OF ACTIVITIES*:

   a. TRANSPORTATION —
   IMPACTS BASED ON THE TRANSPORTATION OF PEOPLE OR PRODUCTS (e.g., "THE RULE HAS PROVISIONS FOR CONFERENCE CALLS INSTEAD OF TRAVEL TO MEETINGS" OR "LOCAL PRODUCTS ARE PREFERENTIALLY PURCHASED TO REDUCE SHIPPING DISTANCE."):
   No expected impact.

b. LAND USE AND DEVELOPMENT —

IMPACTS BASED ON LAND USE AND DEVELOPMENT, FORESTRY, AGRICULTURE ETC. (e.g., "THE RULE WILL RESULT IN ENHANCED, HIGHER DENSITY DOWNTOWN DEVELOPMENT." OR "THE RULE MAINTAINS OPEN SPACE, FORESTED LAND AND /OR AGRICULTURAL LAND."):

No expected impact.

c. BUILDING INFRASTRUCTURE —

IMPACTS BASED ON THE HEATING, COOLING AND ELECTRICITY CONSUMPTION NEEDS (e.g., "THE RULE PROMOTES WEATHERIZATION TO REDUCE BUILDING HEATING AND COOLING DEMANDS." OR "THE PURCHASE AND USE OF EFFICIENT ENERGY STAR APPLIANCES IS REQUIRED TO REDUCE ELECTRICITY CONSUMPTION."):

No expected impact.

d. WASTE GENERATION / REDUCTION —

IMPACTS BASED ON THE GENERATION OF WASTE OR THE REDUCTION, REUSE, AND RECYCLING OPPORTUNITIES AVAILABLE (e.g., "THE RULE WILL RESULT IN REUSE OF PACKING MATERIALS." OR "AS A RESULT OF THE RULE, FOOD AND OTHER ORGANIC WASTE WILL BE COMPOSTED OR DIVERTED TO A 'METHANE TO ENERGY PROJECT'."):

No expected impact.

e. OTHER —

IMPACTS BASED ON OTHER CRITERIA NOT PREVIOUSLY LISTED:

Compared with the sound-level requirements imposed by the Board in prior proceedings authorizing the development of wind generation facilities and the Board's temporary rule on sound levels from wind generation facilities, the exterior sound level standard proposed by the Board is more restrictive. As a result, the rule may result in fewer potential locations for the development of wind generation facilities, which may have indirect effects on greenhouse gas emissions.

Administrative Procedures – Public Input Statement

Instructions:

In completing the public input statement, an agency describes what it did do, or will do to maximize the involvement of the public in the development of the rule. This form must be completed for the following filings made during the rulemaking process:

- Proposed Rule Filing
- Final Proposed Filing
- Adopted Rule Filing
- Emergency Rule Filing

1. TITLE OF RULE FILING:

   Rule on Sound Levels from Wind Generation Facilities

2. ADOPTING AGENCY:

   Public Service Board

3. PLEASE LIST THE STEPS THAT HAVE BEEN OR WILL BE TAKEN TO MAXIMIZE PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF THE PROPOSED RULE:

   Prior to the initial filing of the proposed rule, the Board engaged in an extended proceeding to solicit public input in the development of the proposed rule. Between August, 2016, and February, 2017, the Board: (1) received two rounds of written comments; (2) conducted a day-and-a-half of workshops with interested stakeholders to discuss approaches to the rulemaking; and (3) distributed a discussion draft of a rule for public consideration, followed by a round of written comments on the discussion draft.

   Subsequent to the filing of the proposed rule, the Board has conducted three public hearings, including two located in areas proximate to areas that have first-hand experience with wind development, conducted an all-day workshop on technical aspects of the rule, and received two further rounds of written comment. In addition, the Board has maintained a website on which it has posted copies of the proposed rule and many of the participants' substantive comments in order to foster public engagement and dialogue on the substance of the rule.

4. BEYOND GENERAL ADVERTISEMENTS, PLEASE LIST THE PEOPLE AND ORGANIZATIONS THAT HAVE BEEN OR WILL BE INVOLVED IN THE DEVELOPMENT OF THE PROPOSED RULE:

The Board has received hundreds of public comments from individual Vermonters and organizations on the proposed rule. As a result, we have not reproduced the name of each individual commenter below. Copies of the public comments received have been attached to this filing.

Administrative Procedures – Scientific Information Statement

Instructions:

In completing the Scientific Information Statement, an agency shall provide a brief summary of the scientific information including reference to any scientific studies upon which the proposed rule is based, for the purpose of validity.

This form is only required when a rule relies on scientific information for its validity.

1. TITLE OF RULE FILING:

   Rule on Sound Levels from Wind Generation Facilities

2. ADOPTING AGENCY:

   Public Service Board

3. BRIEF EXPLANATION OF SCIENTIFIC INFORMATION:

   The scientific information consists of technical information on sound propagation and studies that examine he attenuation of sound from outside to inside residences, the potential for public health impacts of exposure to sound from wind turbines, and community response to wind generation facilities.

4. CITATION OF SOURCE DOCUMENTATION OF SCIENTIFIC INFORMATION:

   1. Potential Impact on the Public's Health from Sound Associated with Wind Turbine Facilities, Vermont Department of Health, October 15, 2010

   http://www.healthvermont.gov/sites/default/files/documents/2016/11/PHA_wind_turbine_sound_10_15_2010.pdf

   2. Guidelines for Community Noise, World Health Organization, 1999

   http://apps.who.int/iris/handle/10665/66217

   3. Night Noise Guidelines for Europe, World Health Organization, 2009

   http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf

   4. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, United States Environmental Protection Agency, March 1974.

https://nepis.epa.gov/Exe/ZyNET.exe/2000L3LN.TXT?ZyActionD=ZyDocument&Client=EPA&Index=Prior+to+1976&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C70thru75%5CTxt%5C00000001%5C2000L3LN.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

5. Wind Turbine Noise and Health Study: Summary of Results, Health Canada

http://www.hc-sc.gc.ca/ewh-semt/noise-bruit/turbine-eoliennes/summary-resume-eng.php

6. Wind Turbine Health Impact Study: Report of Independent Expert Panel prepared for Massachusetts Department of Environmental Protection and Department of Public Health, January 2012.

http://www.mass.gov/eea/docs/dep/energy/wind/turbine-impact-study.pdf

7. Understanding the Evidence: Wind Turbine Noise, The Expert Panel on Wind Turbine Noise and Human Health, Council of Canadian Academies, 2015.

http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/wind-turbine-noise/WindTurbineNoiseFullReportEn.pdf

8. The Measurement of Low Frequency Noise at Three UK Wind Farms, Hayes McKenzie Partnership Ltd for the Department of Trade & Industry, 2006.

http://webarchive.nationalarchives.gov.uk/20090609003228/http://www.berr.gov.uk/files/file31270.pdf

9. Differences in noise regulations for wind turbines in four European countries, Nieuwenhuizen and Kohl

https://www.mp.nl/sites/all/files/publicaties/Nieuwenhuizen_Euronoise_2015.pdf

10. NANR116 Open-Closed Window Research Report, Waters-Fuller, T., Lurcock, D., Mackenzie, R. & MacKenzie, R., 2007.

http://www.napier.ac.uk/~/media/worktribe/output-239387/no010768134frppdf.pdf

11. Highway Traffic Noise: Analysis and Abatement Guidance, U.S. Department of Transportation Federal Highway Administration, 2011.

https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf

5. INSTRUCTIONS ON HOW TO OBTAIN COPIES OF THE SOURCE DOCUMENTS OF THE SCIENTIFIC INFORMATION FROM THE AGENCY OR OTHER PUBLISHING ENTITY:

For each source document listed above, the Board has provided a URL where the document may be obtained.

Administrative Procedures – Incorporation by Reference Statement

Instructions:

In completing the incorporation by reference statement, an agency describes any materials that are incorporated into the rule by reference and why the full text was not reproduced within the rule.

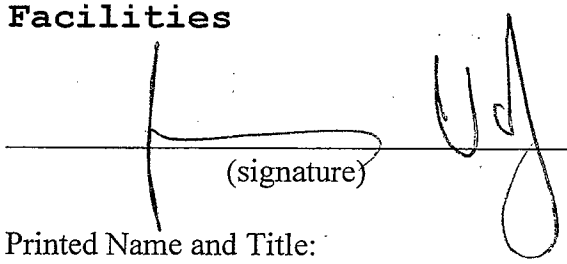
This form is only required when a rule incorporates materials by referencing another source without reproducing the text within the rule itself (e.g. federal or national standards, or regulations).

Copies of incorporated materials will be held by the Office of the Secretary of State until adoption or formal withdrawal of the rule is complete. Materials will be returned to the agency upon completion of the rule.

All forms requiring a signature shall be original signatures of the appropriate adopting authority or authorized person.

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I certify that the text of the matter incorporated has been reviewed by an official of the agency. I further certify that the agency has the capacity and intent to enforce the rule entitled:

Rule Title: Rule on Sound Levels from Wind Generation Facilities



_____, on 5/16/2017.
(signature) (date)

Printed Name and Title:

James Volz, Chair, Vermont Public Service Board

1. TITLE OF RULE FILING:

   Rule on Sound Levels from Wind Generation Facilities

2. ADOPTING AGENCY:

   Public Service Board

3. DESCRIPTION (*DESCRIBE THE MATERIALS INCORPORATED BY REFERENCE)*:

   The rule incorporates several technical standards that relate to the appropriate methodology for modeling and measuring sound and calibrating and manufacturing sound equipment.

4. OBTAINING COPIES: *(EXPLAIN HOW THE MATERIAL(S) CAN BE OBTAINED BY THE PUBLIC, AND AT WHAT COST)*:

   The standards are available for purchase from the applicable standards authority. In addition, the Board will retain a copy available for public inspection at its offices at 112 State St., 4th Floor, Montpelier, VT 05602.

5. MODIFICATIONS (*PLEASE EXPLAIN ANY MODIFICATION TO THE INCORPORATED MATERIALS E.G., WHETHER ONLY PART OF THE MATERIAL IS ADOPTED AND IF SO, WHICH PART(S)ARE MODIFIED)*:

   There are no modifications to the incorporated materials.

6. REASONS FOR INCORPORATION BY REFERENCE (*EXPLAIN WHY THE AGENCY DECIDED TO INCORPORATE THE MATERIALS RATHER THAN REPRODUCE THE MATERIAL IN FULL WITHIN THE TEXT OF THE RULE*):

   The incorporated standards are, in general, technical protocols for conducting sound measurements or constructing and calibrating sound measurement equipment. In addition, many of the protocols are lengthy documents for which direct reproduction in the rule would result in a rule consisting mostly of measurement and calibration protocols, thus obscuring the underlying requirements of the rule. The Board has attached a memorandum that provides a brief description of each of the standards incorporated in the rule.

7. THE INCORPORATED MATERIALS HAVE BEEN REVIEWED BY THE FOLLOWING OFFICIAL OF THE AGENCY:
   Kevin Fink; Thomas Knauer

8. THE ADOPTING AGENCY REQUESTS THAT ALL COPIES OF INCORPORATED MATERIALS BE RETURNED TO THE AGENCY .

Run Spell Check

112 State Street
4th Floor
Montpelier, VT 05620-2701
TEL: 802-828-2358

TTY/TDD (VT: 800-253-0191)
FAX: 802-828-3351
E-mail: psb.clerk@vermont.gov
Internet: http://psb.vermont.gov

State of Vermont
Public Service Board

May 16, 2017

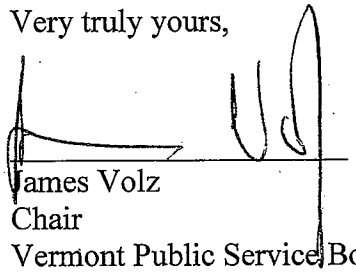
Secretary Jim Condos
Office of the Vermont Secretary of State
128 State Street
Montpelier, VT 05633-1101

Dear Secretary Condos:

Please find attached a summary of the changes that the Vermont Public Service Board ("Board") has made to the proposed Rule 5.700 which was published by the Office of the Vermont Secretary of State on March 22, 2017, and numbered 17P-010.

The final proposed rule reflects the Board's consideration of the comments that were received in the rulemaking process. Accordingly, this letter describes the changes that appear in the final proposed rule that was filed with the Office of the Vermont Secretary of State.

Very truly yours,



James Volz
Chair
Vermont Public Service Board

Changes made to the proposed rule

5.702 Definitions

In this section, the Board added a definition of contributing turbines. In addition, the Board reordered the listing of terms in this section to list definitions in alphabetical order and made formatting changes.

For the purposes of this Rule, the following definitions shall apply:

~~A.~~ Board: *the Vermont Public Service Board.*
Contributing turbines: *the turbine or group of turbines at a wind generation facility whose removal from a facility sound model results in a residual project-only predicted sound pressure level at the receptor of less than 30 dBA or a reduction in predicted turbine contribution of at least 6 dB at the point of measurement*
~~B.~~ CPG: *certificate of public good.*
~~C.~~ CPG Holder: *a person or company who has received a CPG pursuant to 30 V.S.A. § 248 or § 8010 for a wind generation facility.*
~~D.~~ dB: *a unit used to measure the intensity of a sound wave using a logarithmic scale.*
~~E.~~ dBA: *A-weighted decibel*
~~F.~~ Department: *the Vermont Department of Public Service.*
L_{A10}: *Sound level exceeded during 10% of a measurement period*
L_{A50}: *Sound level exceeded during 50% of a measurement period*
L_{A90}: *Sound level exceeded during 90% of a measurement period*
L_{eq}: *Continuous sound level in dB equivalent to the total sound energy over a given period of time*
NRO mode: *Noise Reduced Operation mode, in which the rotational speed of wind turbines is limited in order to reduce their sound emissions*
Participating landowner: *a landowner who has signed a written agreement with a Petitioner stating that the sound emission and setback standards established by this rule do not apply to the landowner's property*
~~G.~~ Petitioner: *a person or company who has filed a petition for a CPG pursuant to 30 V.S.A. § 248 or -8010 to construct and/or operate a wind generation facility.*
~~H.~~ Plant capacity: *pursuant to 30 V.S.A. § 8002, "plant capacity" means the rated electrical nameplate for a wind generation facility.*
~~I.~~ Residence: *a permanent structure for human habitation that is occupied by one or more people for a minimum of 90 days each year.*
~~J.~~ SCADA: *supervisory control and data acquisition or similar system capable of measuring and recording turbine operation and meteorological data in one-minute time intervals.*
~~K.~~ Wind generation facility: *a wind-driven electric generation facility for which a petition for a CPG pursuant to 30 V.S.A. § 248 or § 8010 is submitted to the Board on or after July 1, 2017.*

~~(A) L_{eq}: Continuous sound level in dB equivalent to the total sound energy over a given period of time.~~

~~(B) L_{A90}: Sound level exceeded during 90% of a measurement period.~~

~~(C) L_{A10}: Sound level exceeded during 10% of a measurement period.~~

~~(D) L_{A50}: Sound level exceeded during 50% of a measurement period.~~

~~(E) Participating landowner: a landowner who has signed a written agreement with a Petitioner stating that the sound emissions standards established by this rule do not apply to the landowner's property.~~

~~L. NRO mode: Noise Reduced Operation mode, in which the rotational speed of wind turbines is limited in order to reduce their sound emissions.~~

5.703 General Rule

The Board modified this section to make the following changes: (1) establish a new category of facilities with a plant capacity of less than 50 kW and establish a distinct compliance standard for such facilities; (2) remove the nighttime limit for facilities with a capacity of 150 kW or less; (3) change the separate nighttime sound level requirements to 39 dBA from 35 dBA for facilities with a plant capacity greater than 150 kW; (4) incorporate a tonality penalty into the calculation of sound levels for facilities greater than 50 kW, rather than applying a separate tonality standard; (5) clarify that the setback requirement applies as a distance from the sound producing equipment located in the footprint of the array; and (6) provide for the possibility of a waiver of the setback requirements applicable to facilities with a plant capacity greater than 150 kW.

No wind generation facility shall emit sound levels in excess of the following during operation:

(A) Facilities with a plant capacity ~~of 150~~up to and including 50 kilowatts ~~or less~~. Operation of facilities with a plant capacity ~~of 150~~up to and including 50 kilowatts ~~("kW") or less~~ shall not result in: ~~(1~~ (1) sound pressure levels that exceed 42 dBA more than 5% of the time at a distance of 100 feet from the residence of a non-participating landowner; or (2) audible prominent discrete-frequency tones pursuant to the latest revision of ANSI S1.13 Annex A at a distance of 100 feet from the ~~residences of non-participating landowners; and (2) sound pressure levels in excess~~residence of ~~42 dBA between the hours of 7 A.M. and 9 P.M. and 35 dBA between the hours of 9 P.M. and 7 A.M. at a distance of 100 feet from the residences of a~~ non-participating ~~landowners. In lieu of demonstrating compliance with this limit, a petitioner may propose to locate a wind generation facility such that every sound producing element of the facility will be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residences of non-participating landowners~~landowner.

(B) Facilities with a plant capacity ~~of~~ greater than 50 and up to and including 150 ~~kW~~kilowatts. Operation of facilities with a plant capacity ~~of~~ greater than 50 kilowatts and up to and including 150 ~~kW~~kilowatts shall not result in: ~~(1) audible prominent~~

~~discrete frequency tones~~ sound pressure levels in excess of 42 dBA, including any penalty for tonality pursuant to ~~the latest revision of ANSI S1.13 Annex A~~Section 5.710, at a distance of 100 feet from the ~~residences~~residence of a non-participating ~~landowners; and (2)~~landowner.

~~(B)~~(C) Facilities with a plant capacity greater than 150 kilowatts. Operation of facilities with a plant capacity greater than 150 kW shall not result in sound pressure levels in excess of 42 dBA between the hours of 7 A.M. and 9 P.M. ~~and 35~~or 39 dBA between the hours of 9 P.M. and 7 A.M. ~~at a~~., including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the ~~residences~~residence of a non-participating ~~landowners~~landowner. Each turbine and any sound-producing ~~element of such facilities~~ equipment located within the footprint of the turbine array shall be set back horizontally no less than ten (10) times the ~~turbines'~~turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the ~~residences~~residence of a non-participating ~~landowners~~landowner. This minimum setback requirement may be waived on a case-by-case basis for good cause shown.

5.704 Compliance with the Sound Level Limits

This section of the proposed rule was deleted from the final proposed rule in accordance with the final proposed rules' shift to separately accounting for background sound levels.

~~Compliance with the sound level limits shall be determined in accordance with the following:~~

~~(A) Sound level data shall be aggregated in 10-minute measurement intervals within a given compliance measurement period under the conditions set forth in Section 5.707 of this rule. Each hour of the compliance measurement period shall have six discrete 10-minute measurement intervals.~~

~~(B) Compliance will be demonstrated when the arithmetic average of the equivalent sound level of, at a minimum, twelve 10-minute measurement intervals in a given compliance measurement period is less than or equal to the sound level limit set forth in Section 5.703. The loudest valid 10-minute measurement intervals shall be included in the calculation of the arithmetic average.~~

~~(C) If a given compliance measurement period does not produce a minimum of twelve 10-minute measurement intervals under the atmospheric and site conditions set forth in Section 5.708(E) of this rule, six or more 10-minute measurement intervals from one compliance measurement period may be combined with six or more 10-minute intervals from other compliance measurement periods (e.g., other days). Compliance will be demonstrated when the arithmetic average of the combined 10-minute measurement intervals is less than or equal to the applicable equivalent sound level limit set forth in Section 5.703. The loudest valid 10-minute measurement intervals shall be included in the calculation of the arithmetic average.~~

5.704 Pre-Construction Sound Modeling

The Board re-ordered several sections of the proposed rule in order to organize the rule in manner consistent with the chronological order in which a project would be subject to its parts. Accordingly, Section 5.704 of the final proposed rule modified Section 5.705 of the proposed rule, which had previously addressed sound modeling.

In the sound modeling section, the Board made the following changes: (1) providing facilities with a plant capacity of up to and including 50 kilowatts with the option of submitting certification documents from the Small Wind Certification Council and a simplified sound attenuation calculation, in lieu of modeling requirements; (2) adding a requirement to model sound levels at a receiver height of both 4 and 1.5 meters above ground in order to be consistent with sound monitoring results; and (3) several minor language changes to clarify the intent of the rule.

(A) ~~All~~Facilities with a plant capacity up to and including 50 kilowatts. In lieu of submitting sound modeling pursuant to Section 5.704(B), below, petitions to construct and operate a wind generation facility~~, except for~~ with a plant capacity up to and including 50 kilowatts may instead file the following information with its petition:

1. All certification documents from the Small Wind Certification Council showing the results of acoustic sound testing;

2. The distance to the nearest residence(s) in each cardinal direction, as well as an analysis of the expected sound pressure level at those ~~for~~ residences calculated using spherical spreading.

(B) Facilities with a plant capacity of more than 50 kilowatts. All petitions to construct and operate a wind generation facility with a plant capacity of more than 50 kW ~~or less,~~ shall include a sound model developed for the proposed facility that reports the expected maximum project sound pressure levels, without using NRO mode, ~~experienced~~modeled out to a distance where such levels are no greater than 30 dBA. A petitioner must submit the following information with its petition:

- *1. A map depicting the location of all proposed sound sources associated with the wind generation facility, property boundaries for the proposed facility, and all residences within the 30 dBA contour.*

- *2. A description of the major sound sources, including tonal sound sources, associated with operation and maintenance of the facility. The sound model shall be based on the technical specifications of the turbine model(s) with the highest manufacturer apparent sound power level under consideration for use at the facility.*

- *3. The results of sound modeling pursuant to ISO 9613-2, including a description of the equivalent continuous sound levels expected to be produced by the sound sources at a distance of 100 feet from the residences of non-*

participating landowners. The description shall include a full-page isopleths map depicting the predicted sound pressure levels expected to be produced by the wind generation facility at a distance of 100 feet from each residence of a non-participating landowner within the 30 dBA isopleth. The predictive model used to generate the equivalent sound levels expected to be produced by the sound sources shall be designed to represent the "predictable worst case scenario." All model inputs shall be the most realistic and conservative available for each of the items listed below unless otherwise approved by the Board, and shall include, at a minimum, the following:

-a. The maximum apparent sound power output ~~(IEC 61400-11)~~ of the sound sources pursuant to IEC 61400-11;

-b. Modeling in accordance with ISO 9613-2, with each turbine modeled as a point source at hub height;

-c. All turbines operating at ~~full rated~~ maximum apparent sound output;

-d. Attenuation due to air absorption, with conditions set to 10°C and 70% relative humidity;

-e. Attenuation due to ground absorption/reflection, based on mixed ground conditions (G=0.5) for propagation over land and hard conditions (G=0.0) for propagation over water;

-f. Attenuation due to three-dimensional terrain;
~~A receiver~~
-g. Receiver height ~~of four (~~modeled at both 1.5 and 4~~)~~ meters;

-h. Attenuation due to meteorological factors such as relative wind speed and direction (wind rose data), temperature/vertical profiles and relative humidity, sky conditions, and atmospheric profiles;

-i. An adjustment to the maximum ~~rated~~apparent sound power output of the turbines to account for turbine manufacturer uncertainty, determined in accordance with the most recent version of the IEC 61400~~-Part-~~11 standard; and

-j. A disclosure of the model's error, which is intended to account for uncertainties in the modeling of sound propagation for wind energy developments. This error shall be accounted for and incorporated as an addition to the ~~maximum~~full rated output of the sound sources.

4. A description of proposed major sound control measures, including their locations and expected acoustical performance;

•5. A comparison of the expected sound pressure levels from the proposed wind generation facility with the applicable sound pressure level limits of Section 5.703.;

•6. A description and map identifying potential compliance testing locations on or near the proposed wind generation facility site. The identified compliance testing locations shall be selected to take advantage of prevailing downwind conditions and shall be able to meet the site selection criteria outlined in Section 5.707~~(D)~~. The identified locations ~~should~~shall include those locations that are expected to experience the highest model-predicted equivalent sound levels. The locations ~~should~~shall be free from sources of material sound contamination.

•7. Prior to commencing site preparation or construction of ~~the~~a facility, a CPG Holder shall update, supplement, and/or amend the sound modeling to reflect any changes to the sound-producing elements of the facility. An opportunity to review and comment on any change to the sound modeling, and to request a hearing, shall be given to all parties to the 30 V.S.A. § 248 proceeding who ~~have~~had standing on the issue of sound. The Board may, in its discretion, grant a hearing if a party who ~~has~~had standing on the issue of sound demonstrates that the revised sound modeling represents a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703. If the Board holds a hearing, the CPG Holder may not commence site preparation or construction of the facility until the Board resolves the issue.

5.705 Post-Construction Sound Monitoring Applicability

This section of the final proposed rule was added by the Board to state the requirements for certain types of facilities to conduct post-construction sound monitoring to verify their compliance with the rule. Elements of this section were previously included in Section 5.706 of the proposed rule.

In this section, the Board made the following changes: (1) exempting facilities with a plant capacity of up to 50 kilowatts from the requirement to conduct post-construction sound monitoring unless it determines that there is a probability of an exceedance; (2) applying the option to avoid sound monitoring through setbacks to facilities of greater than 50 and up to and including 150 kilowatts of capacity; (3) revising the standard under which the Board may require additional monitoring if an exceedance is probable; and (4) minor modifications to cross-references and grammar.

(A) ——Facilities with a plant capacity up to and including 50 kilowatts. Post-construction sound monitoring may be required by the Board for a facility in this category if it is determined that exceedances of the applicable sound-level limit are probable or as part of an investigation into one or more complaints.

(B) Facilities with a plant capacity greater than 50 and up to and including 150 kilowatts. Sound monitoring shall take place in accordance with Section 5.707, below, or pursuant to an alternative monitoring plan adopted in the facility's CPG. In lieu of verifying compliance with the applicable sound-level limit through sound monitoring, a petitioner may propose to locate a wind generation facility in this category such that every sound-producing element of the facility within the turbine footprint will be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner.

(C) Facilities with a plant capacity greater than 150 kilowatts. Sound monitoring shall take place during the times specified in section 5.~~708(D),~~711, in accordance with the requirements of this rule and any requirements of the CPG, which shall specify the minimum number of compliance monitoring locations, the radius from the nearest facility turbine in which monitoring locations may be selected, and the time period of monitoring. The monitoring will be used to verify the accuracy of the pre-construction modeling and facility compliance with CPG conditions and the requirements of this rule. In addition to the requirements of this rule and the CPG, the Board may, at its discretion, ~~the Board may~~ require additional monitoring if the results of the initial post-construction sound monitoring or changes to the facility or its operation indicate that exceedances of the sound-level limit are ~~likely~~probable.

5.706 Post-Construction Sound Monitoring General Requirements

This section of the final proposed rule remains largely unchanged from Section 5.706 of the proposed rule. In this section, the Board made changes to state that proposed monitoring locations shall be free from sources of material sound contamination and clarify that the proceeding in which a certificate of public good was granted for the project will be concluded at the point that post-construction sound monitoring is occurring.

~~1.~~(A) Monitoring by the State. Post-construction sound monitoring shall be conducted under the direct supervision and control of a State of Vermont agency or agencies designated by the Board. The post-construction sound monitoring shall be paid for by the CPG Holder.

~~2.~~(B) Monitoring locations. A petition for a CPG for a wind generation facility shall include proposed monitoring locations for post-construction monitoring. The proposed locations shall include residential locations that are expected to experience the highest model-predicted equivalent sound levels and are consistent with the requirements of Section 5.707~~(D)~~. The proposed locations ~~should~~shall be free from sources of material sound contamination. Any change in monitoring locations must be approved in advance by the Board.

~~3.~~(C) Modification of pre-construction sound modeling. A CPG Holder is required to identify the appropriate inputs and/or assumptions, and modify the pre-construction sound modeling if the post-construction sound monitoring indicates that there is a reasonable likelihood that the expected highest sound levels at any of the monitoring

locations would be equal to or greater than 3 dBA above those modeled, or would result in an exceedance of the sound level standard specified in Section 5.703. All parties to the 30 V.S.A. § 248 or § 8010 proceeding ~~who have~~in which a CPG was granted who had standing on the issue of sound shall be given an opportunity to review and comment on any change to the sound modeling. The Board may, in its discretion, grant a hearing if a party who ~~has~~had standing on the issue of sound demonstrates that the revised sound modeling indicates a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703.

5.707 Post-Construction Sound Monitoring Methodology

Section 5.707 of the final proposed rule was modified from Section 5.707 of the proposed rule in the following ways: (1) adding a requirement that monitoring equipment be able to gather and record humidity data; (2) requiring that proposed monitoring locations be sited such that they can be reasonably expected to experience downwind conditions and are not prone to contamination from other sound sources; (3) modifying the microphone height requirement to 1.5 meters rather than 4 feet; (4) deleting a requirement to provide turbine operational data that was stated elsewhere in the rule; and (5) making several formatting and grammatical changes.

(A) ~~(A)~~ Measurement ~~Personnel~~personnel. Measurements shall be supervised by personnel who are well qualified by training and experience in measurement and evaluation of environmental sound. Certification through the Institute of Noise Control Engineering shall meet the qualification requirements of this section.

(B) ~~(B)~~ Measurement ~~Instrumentation~~instrumentation. The sound meter or alternative sound measurement system used shall meet all appropriate industry standards and specifications. Each monitoring site shall include installation of an anemometer and other equipment or sensors capable of gathering and recording weather conditions at the microphone (10-meter-level wind speed, wind direction, temperature, humidity, and precipitation) and be equipped with enhanced-performance windscreens capable of significantly reducing or eliminating wind-induced noise contamination over the microphone. The measurement instrumentation shall meet the following specifications unless otherwise approved by the Board:

~~(A)~~1. ~~A~~The sound level meter or alternative sound level measurement system ~~used~~ shall meet the Type 1 performance requirements of American National Standard Specifications for Sound Level Meters, ANSI S1.4.

~~(B)~~2. ~~An~~The integrating sound level meter (or measurement system) shall also meet the Type 1 performance requirements for integrating/averaging in the International Electrotechnical Commission Standard on Integrating-Averaging Sound Level Meters, IEC Publication 61672-1.

~~(C)~~3. ~~A~~The filter for determining the existence of tonal sounds shall meet all the requirements of the American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters, ANSI S1.11

and IEC 61260, Type 3-D performance.

~~(D)~~4. The acoustical calibrator ~~used~~ shall be of a type recommended by the manufacturer of the sound level meter and one that meets the requirements of American National Standard Specification for Acoustical Calibrators, ANSI S1.40.

~~(E)~~5. Anemometer(s) ~~used~~ for surface (10 meter (m)) (32.8 feet) wind speeds shall have a minimum manufacturer specified accuracy of ±1 mph providing data in 10-second integrations and 10-minute average/maximum values for the evaluation of atmospheric stability.

~~(F)~~6. Audio recording devices shall be time stamped (hh:mm:ss), recording the sound signal output from the measurement microphone to be used for identifying events. Audio recording and compliance data collection shall be measured through the same microphone/sound meter and bear the same time stamp.

(C) ~~(C)~~ Equipment ~~Calibration~~calibration.

1. *The sound level meter shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign, and the microphone's response shall be traceable to the National Institute of Standards and Technology.*

2. *Field calibrations shall be recorded and documented in compliance monitoring reports.*

3. *The 10-meter anemometer(s) and vane(s) shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign.*

(D) ~~(D)~~ Compliance ~~Measurement Location, Configuration~~measurement location, configuration, and ~~Environment~~environment.

1. *Compliance measurement locations shall be approved by the Board during its review of a facility's request for a CPG and shall be representative of the non-participating residences expected to experience the highest ~~equivalent~~model-predicted facility-only sound levels from routine operation of the wind generation facility, subject to permission from the respective property owner(s). Measurement locations shall reasonably be expected to experience downwind conditions from acoustically significant turbines and shall be free from significant sources of sound contamination, such as high-traffic roadways, industrial or silvicultural activity, etc.*

   a. *To the greatest extent possible, compliance measurement locations shall be at the center of unobstructed areas that are maintained free of*

vegetation and other structures or material that is greater than 2 feet in height for a 75-foot radius around the sound and audio monitoring equipment.

b. *To the greatest extent possible, meteorological measurement locations shall be at the center of open flat terrain, inclusive of grass and minimum number of obstacles that are greater than 6 feet in height for a 250-foot radius around the anemometer location. Meteorological measurements shall be taken at the monitoring location at or above the height of the audio/acoustic microphone.*

c. *Meteorological measurements of wind speed and direction shall be collected using anemometers at a 10-meter height (32.8 feet) above the ground. Results shall be reported, based on 10-second integration intervals, synchronously with turbine nacelle measurements and measurements made at the sound-meter level at ~~10~~one-minute measurement intervals. The wind speed average and maximum for each ~~10~~one-minute interval shall be reported.*

d. *The sound microphone shall be positioned at a height of approximately ~~4 to~~ 1.5 ~~feet~~meters above the ground, and oriented in accordance with the manufacturer's recommendations.*

e. *When possible, measurement locations should be at least 50 feet from any sound source. The proposed locations ~~should~~shall be free from sources of material sound contamination. Any non-facility sources of sound shall be noted in the analysis.*

~~*4. The CPG Holder shall provide all relevant turbine operational data for the monitoring period, including SCADA data for all turbines, the date, time, and duration of any noise reduction operation or other operational changes that occur during the compliance measurement period.*~~

5.708 Determination of Background/Ambient Sound Levels

This section of the final proposed rule was added by the Board to establish a requirement for turbine shutdowns to account for background sound levels.

In order to determine the ambient sound levels at a receptor, turbine shutdowns will be required as part of post-construction sound monitoring. A CPG Holder shall conduct turbine shutdowns in accordance with the requirements of its CPG. The CPG shall specify the minimum number and duration of turbine shutdowns during the post-construction sound monitoring. The timing of turbine shutdowns shall be determined by the State of Vermont agency overseeing post-construction sound monitoring in consultation with the project operator. In the event that

turbine shutdowns are technically infeasible, background sound levels may be determined using a primary and shielded secondary sound level meter.

5.709 Post-construction Sound Monitoring Specific Measurements

This section of the final proposed rule was added by the Board to state the specific sound measurement data that should be recorded during monitoring.

The following data shall be measured and recorded in one-minute increments:

(A) Acoustic parameters:

1. Overall L_{Aeq} (20-20,000 Hz);

2. Unweighted 1/3rd octave spectra (20-20,000 Hz);

3. Narrowband spectra (20-4,000 Hz, 1-Hz resolution, hanning window).

(B) Meteorological data. All meteorological data as specified in Section 5.712 shall be measured and recorded synchronously with the acoustic parameters listed in Section 5.709(A)1, above.

(C) Turbine operational data including power output, rotor rotational speed, and the meteorological data listed in Section 5.707.

5.710 Post-Construction Sound Monitoring Data Analysis

This section of the final proposed rule was added by the Board to establish the analytic process used to isolate turbine-only sound levels.

(A) All recorded data shall be categorized as "Turbine On" or "Ambient," or shall be excluded.

1. Turbine On data shall meet the following criteria:

a. All Contributing Turbines for a specific receptor shall be operational. The minimum power output for each Contributing Turbine shall be specified in the project's CPG.

b. The monitoring location receptor shall be within 45° of the direction between a specific measurement location and the acoustic center of the five nearest wind turbines, or fewer if the wind generation facility does not have five wind turbines.

2. Ambient data shall be categorized as such only when all Contributing Turbines are shut down or generating less than 1% of nameplate capacity.

3. Data meeting any of the following criteria shall be excluded from analysis:
   a. Data that cannot be categorized as Turbine On or Ambient;

   b. Periods between 10 minutes prior to and one hour after precipitation at the monitoring location is detected;

   c. Intervals contaminated by transient ambient sound sources, such as passing cars, barking dogs, etc.;

   d. Periods when 10-meter wind speed is greater than 5 meters per second.

(B) Additional frequency-based filtering of the data may be performed if unique conditions at the monitoring location(s) justify such action. In such an instance, the designated individual, agency, or company responsible for sound monitoring data analysis shall notify the Board of the intent to apply additional filtering to an identified set of data and the basis for such action. An opportunity to review and comment on any proposed additional filtering shall be given to all parties to the 30 V.S.A. § 248 or § 8010 proceeding in which a CPG was granted who had standing on the issue of sound prior to the commencement of any additional filtering.

(C) Filtered sound monitoring data shall be analyzed consistent with the following protocols.
   1. Overall sound levels shall be derived using the following methodology:

      a. Filtered one-minute L_{Aeq} sound levels shall be separated into Turbine On and Ambient datasets.

      b. Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.

      c. Mean average Turbine On and Ambient sound level shall be computed in each wind bin.

      d. The average Ambient sound level shall be logarithmically subtracted from the average Turbine On sound level in each wind bin to derive the project-only sound level.

      e. Wind bin averages shall not be reported if the difference between the Turbine On average sound level and Ambient sound level in a wind bin is less than 3 dBA.

   2. Sound monitoring data analysis shall be based on a minimum of 120 filtered one-minute L_{Aeq} data points. In the event that 20 valid data points in each of

the six wind bins are not available, wind bin averages may be reported when there are a minimum of 40 one-minute L_{Aeq} sound levels in at least three wind bins. If sufficient valid data are not obtained after ten (10) weeks of monitoring, the State of Vermont agency designated by the Board shall provide a status update and recommendation for any additional monitoring to the Board.

3. *Tonality shall be determined and applied to the overall sound level using the following methodology.*

   a. *Filtered narrowband spectra shall be separated into Turbine On and Ambient datasets.*

   b. *Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.*

   c. *The overall average tonal audibility for each wind bin shall be calculated pursuant to the methodology contained in IEC 61400-11 or the latest revision of the same.*

   d. *If tonal audibility in any wind bin is greater than 2 dB, a penalty to the project-only sound level in that wind bin shall be applied pursuant to ISO 1996-2, Figure C.1 or the latest revision of the same.*

5.711 Compliance Data Collection, Measurement, and Retention Procedures

This section of the final proposed rule was modified from Section 5.708 of the proposed rule in the following manner: (1) deleting the statement that data collection shall take place in accordance with the section governing that collection; (2) modifying the requirement for periodic post-construction monitoring to require that monitoring occur during the first year of facility operation and during each successive fifth year thereafter, and including a requirement to conduct sound power testing during the first year; (3) providing that the Board and Department may require or recommend, respectively, sound power testing of a facility; (4) clarifying that turbine operational data provided should include information on the use of noise-reduced operations; and (5) deleting provisions that provided for use of an alternative monitoring methodology that accounted for background sound.

~~*(A) Measurements of operational, sound, audio, and meteorological data shall occur as set forth in Section 5.707.*~~

~~*(B)*~~*(A) All operational, sound, audio, and meteorological data collected shall be retained by the State of Vermont agency or agencies designated by the Board for the life of the project and subject to inspection upon request.*

~~(C)~~(B) Monitoring and data collection shall occur at a minimum:

~~1. Once during each of the first four years of facility operation, provided, however, that if after three years the monitoring does not detect and the updated sound model does not predict any exceedances of the applicable equivalent sound pressure level in Section 5.703, the fourth year of monitoring and data collection under this subsection shall not be required;~~

1. Once during the first year of facility operation, including sound power testing pursuant to IEC 61400-11 for each turbine;

2. Once during each successive fifth year thereafter until the facility is decommissioned; and

~~3. In response to a complaint if ordered by the Board.~~

~~a.~~3. The Board in its discretion may require additional sound monitoring or sound power testing for a wind generation facility in response to a complaint if the Board determines that a complaint raises a reasonable possibility that a wind generation facility is operating in excess of the sound level limits required by this rule. In making its determination, the Board shall consider:

~~i.~~a. The details of the complaint;

~~ii.~~b. Any response thereto filed by the operator of the wind generation facility; and

~~iii.~~c. Any response and recommendation by the Department of Public Service after its review of the complaint, the facility operator's response, and any attempts made to resolve the complaint under the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.). As part of any recommendation, the Department may propose a plan for additional sound monitoring or sound power testing of the subject wind generation facility. Any such proposal should incorporate the requirements and standards set forth in subsection (b), below, or set forth an explanation why different requirements and standards are being proposed.

~~a. Any monitoring ordered by~~All relevant turbine operational data (SCADA); the ~~Board pursuant to this subsection:~~

~~i. Shall conform to the meteorological requirements set forth in Section 5.708(E) of this rule, if possible.~~

~~ii. Shall be done under meteorological conditions as similar as possible to the conditions existing at the~~date, ~~time of the complaint.~~

~~iii. In the event~~, and duration of any NRO or other operational

changes that ~~*the monitoring cannot be performed pursuant to the meteorological requirements set forth in Section 5.708(E) of this rule due to prevailing meteorological or environmental conditions at the time the complaint is filed and when the monitoring will take place, then the Department of Public Service may propose a plan of*~~ *occur during the sound monitoring* ~~*for review and approval by the Board. Any such proposed monitoring plan should:*~~

~~*1. Require that sound monitoring be performed under meteorological conditions similar to those that existed at the time the complaint was made;*~~

~~*2. Provide for sound monitoring compliance testing consistent with the requirements of Section 5.704 of this rule with monitoring continuing until the requisite number of measurement intervals are collected.*~~

~~*iv. The sound monitoring methodology for any such proposal shall be consistent with the requirements of Section 5.707 of this rule.*~~

~~*v. Microphones shall be placed in locations that avoid material sound contamination. All microphone locations must be approved by the Board.*~~

~~*vi. Primary microphones shall not be placed such that any structure blocks the line of sight between the microphone and the facility's turbines (if otherwise visible).*~~

~~*vii. Provide a process for determination of facility-only sound. In the event the determination of facility-only sound will rely on subtracting background sound levels from overall sound levels (i.e. sound levels with the facility's turbines in operation), such background sound levels shall be determined by measurements taken with the facility's wind turbines shut down for a period of at least 30 minutes both before and after sound monitoring is performed to determine total sound levels with the facility in operation.*~~

~~*viii. The monitoring shall be performed with at least 90% of the facility's turbines operating at maximum sound power levels. Monitoring shall continue until the requisite amount of data is collected under these operating conditions.*~~

~~*ix. Measurement intervals affected by increased biological activities, leaf rustling, traffic, high water flow, aircraft flyovers, or other extraneous ambient noise sources that affect the ability to demonstrate compliance shall be excluded from all compliance report data.*~~

~~*x. Reporting of the results of the monitoring shall be done consistent with the requirements of section 5.709 of this rule.*~~

~~*(D)*~~*(C)* ~~*All operational (SCADA),*~~*; and sound level and meteorological data collected during a compliance measurement period that meets or exceeds the specified wind speed parameters shall be submitted by the State of Vermont agency or agencies designated by the Board to the Board for review and approval. All data shall be*

submitted to the Board within 60 days of completion of the monitoring period as part of the post-monitoring report. Audio recordings will only be submitted upon request and may be filtered to exclude private conversations and/or submitted under a confidentiality order.

~~*(E) Measurements shall be obtained during weather conditions when the wind turbine sound is dominant and overall sound levels are not influenced by non-facility sounds. Such conditions are generally expected at night, when the measurement location is downwind of the wind generation facility and maximum surface wind speeds (10-meter height) are equal to or less than 6 miles per hour (mph) with concurrent turbine hub-elevation wind speeds sufficient to generate the highest continuous apparent sound power, +/- 1 dB, from the nearest wind turbines to the measurement location. A downwind location is defined as within 45° of the direction between a specific measurement location and the acoustic center of the five nearest wind turbines, or fewer if the wind generation facility does not have five wind turbines. In some circumstances, it may not be feasible to meet the wind speed and operations criteria due to terrain features or limited elevation change between the wind turbines and monitoring locations. In these cases, measurement periods are acceptable if the following conditions are met:*~~

~~*1. The difference between the L_{A90} and L_{A10} during any 10-minute period is less than 5 dBA; and*~~

~~*2. The surface wind speed (10-meter height) (32.8 feet) is 6 mph or less for 80% of the 10-minute measurement period and does not exceed 10 mph at any time, or the turbines are shut down during the monitoring period and the difference in the observed L_{A50} after shutdown is equal to or greater than 6 dBA; and*~~

~~*3. Observer logs or recorded sound files clearly indicate the dominance of wind turbine(s).*~~

~~*4. Measurement intervals affected by increased biological activities, leaf rustling, traffic, high water flow, aircraft flyovers, or other extraneous ambient noise sources that affect the ability to demonstrate compliance shall be excluded from all compliance report data. The intent is to obtain 10-minute measurement intervals that entirely meet the specific criteria and represent facility-only sound pressure levels.*~~

5.712 Reporting of Compliance Measurement Data

In this section of the final proposed rule, which carried forward the provisions of Section 5.709 of the proposed rule, the Board made minor grammatical changes and modified the reporting requirements to require 1-minute interval data rather than 10-minute interval data.

Compliance ~~Reports~~reports shall be submitted to the Board within 60 days of the completion of the sound monitoring period. The Board will make the report publicly available. The report shall include a certification that the required monitoring conditions were present and, at a minimum, the following:

(A) A narrative description of the sound from the wind generation facility for the compliance measurement period;

(B) The dates, days of the week, and hours of the day when measurements were made;

(C) The wind direction and speed, temperature, humidity, and sky condition;

(D) Identification of all measurement equipment by make, model, and serial number;

(E) All meteorological, sound, windscreen, and audio instrumentation specifications and calibrations;

(F) All A-weighted equivalent sound levels for each ~~10~~1-minute measurement interval;

(G) Short-period sound level measurements (50 milliseconds or less);

(H) All L_{A10}, L_{A50}, and L_{A90} percentile levels;

(I) All ~~10~~1-minute 1/3 octave band unweighted and equivalent continuous sound levels (dB);

(J) Should any sound data collection be observed by a trained attendant, a summary of the attendant's notes and observations ~~shall be summarized and included with the Compliance Report~~;

(K) All concurrent time-stamped, turbine-operational data including the date, time, and duration of any noise-reduction operation or other interruptions in operations, if present; and

(L) All other information determined necessary by the Board.

5.713 Complaint Response Procedures

Section 5.713 of the final proposed rule carries forward provisions from Section 5.710 of the proposed rule. In this section, the Board made modifications to clarify that the section applied to the holders of certificates of public good to respond to complaints in a manner consistent with the complaint response procedures adopted by the Department of Public Service, rather than applying to individual complainants or the Department.

~~Complaints~~ CPG Holders shall respond to complaints raised by residents located near the wind generation facility ~~shall be responded to~~ in a manner consistent with the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.)

Explanation of the Public Service Board's reasons for accepting or rejecting requested changes to the original proposed rule.[1]

The Public Service Board ("Board") received hundreds of comments on the proposed rule. Some supported the proposed sound levels of 42 dBA during the day and 35 dBA at night as well as the proposed setback. Others believed that the proposed levels and setback should be applicable at a wind project's property boundary, not the 100 feet from a neighboring residence proposed by the rule. Some also believed that the rule should be expanded to specifically regulate low-frequency sound and infrasound. Some believed that the setback was not large enough. Still, others commented that the sound levels and the setback in the proposed rule were overly restrictive and would functionally ban the development of new wind projects in Vermont. These commenters were supportive of a more relaxed standard that would allow for the state to continue its transition away from its reliance on fossil fuels, assist the state in meeting its renewable energy goals, support the renewable energy economy, and help combat climate change.

Below is an explanation of the Board's reasons for accepting or rejecting requested changes to the proposed rule contained in these public comments. The explanation proceeds through the rule section-by-section, discusses the comments relevant to each section, and explains the Board's reasons for either accepting or rejecting the comments and any changes made to each section in the proposed rule as a result thereof.

Additionally, minor technical changes were made both in response to comments and as a result of the Board's ongoing review of the original proposed rule.

Lastly, the original proposed rule was reorganized generally to make it more readable and understandable.

5.701 Purpose and Applicability

Summary

This section sets forth the purpose of Rule 5.700 and clarifies that it is applicable to petitions for a certificate of public good ("CPG") for wind-powered electric generation facilities pursuant to 30 V.S.A. § 248 or § 8010 filed on or after July 1, 2017.

5.702 Definitions

Summary

This section sets forth definitions for material terms used throughout Rule 5.700.

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[1] Per 3 V.S.A. § 841(b).

Response to Comments

The Board received several comments critical of the definition of "Residence," asserting that it is too narrow because it excludes camps and properties that are used only occasionally. The Board has elected to retain the definition in the proposed rule because it has used this approach in past proceedings and has not received any information that it is not working. Additionally, extending the definition to include camps or occasional-use properties could unintentionally prohibit an otherwise well-sited project due to what would amount to very limited effects.

One commenter suggested adding definitions for Ldn and dBC and adding language to the definition of "Participating landowner" to prohibit facility operators from entering agreements with landowners that would prohibit the landowner from being critical of a project. The Board has declined to adopt these recommendations. The rule does not rely on the Ldn or dBC metrics, and the definitions are therefore not needed. The Board also does not believe it should restrict the abilities of negotiating parties to agree to otherwise legal terms that they believe are appropriate.

The Board added a definition for "Contributing turbines" because of changes made to the monitoring and data analysis methodology for determining compliance. The Department of Public Service ("Department") and Resource Systems Group ("RSG") both submitted comments recommending that the proposed rule be revised to include a mechanism for removing ambient sounds when determining whether a wind facility is in compliance with the applicable sound limits. This change, discussed below, necessitated the addition of the new definition. The definitions were also rearranged to be in alphabetical order.

5.703 General Rule

Summary

This section creates the basic sound standards with which wind-powered generation facilities must comply.

Facilities with a capacity greater than 150 kW must be sited so that all turbines and sound-producing equipment located within the footprint of the turbine array are a horizontal distance of at least 10 times the height of the turbines, with a blade tip in its vertical position, from the nearest residence of a non-participating landowner. Additionally, the facility must be operated so that sound pressure levels do not exceed 42 dBA at 100 feet from a non-participating residence during the daytime and 39 dBA at night, defined as the hours between 9:00 p.m. and 7:00 a.m. Compliance with the sound limit is demonstrated through post-construction monitoring.

Projects with a capacity above 50 kW and up to 150 kW are subject to a 42 dBA sound limit that applies both during the day and at night and may demonstrate compliance either through post-construction monitoring, or by siting the turbines and any sound-producing

equipment located within the footprint of the turbine array a horizontal distance of at least 10 times the height of the turbines, with a blade tip in its vertical position, from the nearest residence of a non-participating landowner.

The rule also creates a small turbine category, meaning those with a capacity that does not exceed 50 kW. For these turbines, there is no minimum setback requirement or a requirement for sound monitoring post-construction. Instead, petitions for small turbines must include certain certification documents regarding the sound levels produced by these turbines and a simplified demonstration that sound pressure levels at the closest residence will be within the applicable limit. The Board retains discretion to require sound monitoring for small turbines for cause shown on a case-by-case basis. Tonal sounds from small turbines are specifically addressed in this section as well. Tonal sounds for large and medium turbines are addressed through an adjustment to monitoring results as described in Section 5.710(B)(3).

Response to Comments

The original proposed rule established differing sound limits for turbine operations during the daytime and nighttime. The daytime level was 42 dBA and the nighttime level was 35 dBA and was applicable between the hours of 9:00 p.m. and 7:00 a.m. This section generated the greatest amount of comments as compared to any other section of the rule. Comments were both supportive and critical of the proposed limits. Of those who were critical, some commenters felt the limits were too restrictive (*i.e.*, too low) and would bring a halt to any future wind-powered electric generation in Vermont. Others believed the levels were not set low enough and would result in continued sound complaints regarding new projects subject to the rule, while some were critical of the lack of a sound limit for low-frequency sound and infrasound. Still others believed the sound limit and setback should be imposed at the property boundary of a wind facility.

The Board received well over 100 comments from individuals who believed that the 35 dBA sound limit established by the proposed rule was too restrictive and would halt all future development of wind-powered generation in the state. Some of these commenters called the 35 dBA standard unsubstantiated and unprecedented, and the setback distance in the rule unnecessary and arbitrary, asserting that neither had any scientific basis in studies addressing sound from wind turbines. Some others described the 35 dBA level as a sound level somewhere between a whisper and a babbling brook, or a quiet library, noting that many common sources of sound in our daily environment exceed this level on a regular basis, including the sound of the wind in the trees. Still others urged a less restrictive level so as not to interfere with Vermont's transition to renewable energy, with some suggesting the rule is the result of pressure from fossil-fuel industry groups.

As mentioned above, some were critical of the lack of standards for low-frequency sound and infrasound, asserting that such limits are necessary to protect human health. At least one commenter was critical of the lack of controls for amplitude modulation, the swishing noise produced by large wind turbines. Still others were critical that the rule did not establish sound limits to be measured at the property line, claiming that allowing unwanted sounds to encroach onto their property amounted to an unconstitutional taking of that property.

Some commenters also expressed dissatisfaction with the differing levels for daytime and nighttime operations, stating that it would require developers to design to the lower nighttime standard or require the Board to police projects to ensure operators were curtailing operations on a nightly basis to meet the lower limit for nighttime operations.

Some commenters characterized the proposed setback as unnecessary and overly restrictive while others strongly supported it as being protective of neighbors and an efficient tool for screening out poorly sited potential projects.

The Board has carefully considered all of these comments and decided to retain the 42 dBA daytime limit and to change the nighttime limit to 39 dBA for large turbines and projects for six reasons.

First, the Board was persuaded by arguments regarding the potential impact of a 35 dBA limit on wind development in Vermont, and by extension the associated economic impacts in the form of lost tax revenues and ancillary economic activity from employment related to wind turbine development. Information presented by Renewable Energy Vermont ("REV") demonstrated that a 35 dBA limit would eliminate from potential turbine development many sites in Vermont with a wind resource sufficient to support a utility-scale wind generation facility. The Board's goal in developing the rule was to create a standard that would first and foremost be protective of public health. Second, the Board wanted to also reduce annoyance levels that some people might experience from turbine sounds. Lastly, the Board sought to balance those two goals with the state's policy, as evidenced by several legislative actions, to encourage renewable energy development and to significantly reduce the state's reliance on fossil fuels. The Board believes the two new levels strike the right balance between these competing interests. While the Board expects that the 42 dBA daytime level and the 39 dBA nighttime level will limit the number of complaints regarding sound levels from any new projects, it does not expect that such complaints will be entirely eliminated. However, the Board believes that a sound limit that would be low enough to eliminate all complaints would need to be so low that it would act as an effective bar to the development of any new commercial- or utility-scale wind projects in Vermont, an outcome contrary to the state's legislated policy of promoting renewable energy development.

Second, the World Health Organization ("WHO") stated in its 1999 Guidelines for Community Noise, and reiterated in its 2009 Night Noise Guidelines for Europe, that an interior equivalent sound pressure limit of 30 dBA for continuous sounds is appropriate to protect against sleep disturbance. In turn, protecting against sleep disturbance protects against a variety of secondary health-related symptoms that can arise from disturbed sleep. The objective in establishing the 39 dBA exterior nighttime limit for large turbines is to ensure that, except in unusual circumstances, an indoor limit of 30 dBA is realized based on attenuation between the exterior and the interior of a residence, even with windows partially or fully open. According to the WHO, sound levels attenuate between 10 and 17 decibels from the outside of a dwelling to the inside of a dwelling with windows partially open. The Board has elected to be conservative and rely on the low end of that spectrum and believes that the 39 dBA nighttime exterior limit for large turbines will result in a 30 dBA or lower indoor level in the majority of circumstances.

While there may be occasional exceptions, setting an outdoor limit low enough to avoid those exceptions would again require a limit so low as to act as an effective bar to future projects. The Board's reasoning on this point is supported by other sources as well. For example, a 2007 study performed in the UK[2] showed weighted level differences between 7 and 26 dB with windows open 0.2 m^2 for transportation sounds, with most values in the 10 to 17 dB range. Additionally, the United States Environmental Protection Agency developed typical windows-open sound level reductions for transportation noise in both warm and cold climates.[3] For warm climates a 12 dB sound level reduction was specified and for cold climates a 17 dB sound level reduction was specified, with both scenarios assuming an open area of two square feet. Lastly, the Federal Highway Administration has specified a 10 dB windows-open "noise reduction," used to estimate interior levels of traffic noise.[4]

Third, the majority of the literature on the subject indicates that both the 42 dBA and 39 dBA levels are conservative for ensuring against direct health impacts from wind-turbine sound. Literature equates a 40 dBA level to sound levels in a library or those produced by a stream or a refrigerator. Additionally, the limits are applied 100 feet from neighboring residences and levels would naturally be lower inside a residence.

Fourth, the 39 dBA exterior nighttime limit for large turbines eliminates the need for an interior standard and the resulting complexities and expense associated with measuring sound levels in the interior of a residence to determine compliance. Interior monitoring is expensive and difficult to perform given pre-existing interior background sound levels from a variety of sources such as refrigerators and air handlers. The monitoring process is also highly intrusive and interferes with a homeowner's use of the home, particularly because the monitoring should occur in the bedroom where the homeowner would normally sleep. Reliance on an exterior limit that is low enough to ensure an appropriate indoor level avoids the complexity and expense associated with indoor monitoring.

Fifth, one of the control technologies that is available to large turbine operators seeking to limit the sound output of turbines is known as Noise Reduced Operations mode ("NRO"). That technology can typically achieve up to a 3-decibel reduction in the sound output of a turbine. While it is technologically possible to achieve up to 4 decibels of reduction,[5] using a 4-decibel difference between the day and night levels could have the effect of significantly limiting turbine selection, and thus project design. Additionally, if a developer was not confident that a project could achieve a 4-decibel reduction through the use of NRO, that project would need to be designed to meet a standard lower than the allowable daytime limit, which would again be contrary to the state's policy of promoting renewable generation.

Sixth, the Board respectfully disagrees with those commenters who asserted that the previously proposed daytime and nighttime levels for large turbines would effectively halt wind-

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[2] Waters-Fuller and Lurcock, Department for Environment, Food and Rural Affairs, UK, 2007.

[3] U.S. Environmental Protection Agency Office of Noise Abatement and Control. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare. Arlington, Virginia, 1974.

[4] Federal Highway Administration. "Highway Traffic Noise: Analysis and Abatement Guidance." 2011.

[5] One commenter asserted that there was a single turbine model made by a single manufacturer that can achieve up to 5 decibels of sound level reduction when operating in NRO mode.

powered electric generation in Vermont. It is true that site selection will need to be more carefully considered than under the 45 dBA exterior limit the Board has imposed on some existing projects. However, the comments submitted by REV also demonstrate that, while lower limits will reduce the number of sites available with a sufficient wind resource, they do not eliminate them. Additionally, the limits apply only to the residences of non-participating landowners. Therefore, if a developer engages with the neighbor of a proposed project early in the process, the developer may be able to take steps to reach agreement with that neighbor on becoming a participating landowner, thus removing the sound limits for that residence. It is the Board's goal that more "buy-in" from neighbors during the planning process will lead to projects with more support and less controversy.

The Board also disagrees with recommendations that the sound levels apply at the property line. The levels established by the rule are intended to protect against sleep disruption during the night and to prevent undue annoyance during the daytime and are appropriately focused on the area surrounding a residence. The Board acknowledges that many Vermonters own land that extends well beyond their residences and that some percentage of those people may well use all their land for various activities, such as hiking, hunting, riding recreational vehicles, or farming and gardening. However, given the attenuation of sound over distance and the levels applicable near a dwelling, the Board expects that sound levels at property lines will be well below levels at which direct health effects, such as hearing loss, are of concern. The Board also disagrees, as a legal matter, that the encroachment of sound onto a neighboring property at the levels anticipated by the rule constitutes an unconstitutional taking of property.

The Board also does not believe that the rule needs to establish limits for low-frequency sound or infrasound. Based on scientific literature, the Board believes that at sound levels as low as those prescribed by the rule, the levels of low-frequency sound and infrasound that would be emitted are so low as to not be a concern for human health. For example, a study performed in Denmark, which has a low- frequency limit of 20 decibels, concluded that the A-weighted sound-level limits were the controlling factor (i.e., compliance with the A-weighted limits resulted in compliance with the low-frequency limits).

With respect to setbacks for large turbines, the Board has decided to keep the setbacks in place, but to expressly provide for a waiver on a case-by-case basis for cause shown. This allows for projects to be sited at a lesser distance from non-participating residences where, for example, it can be convincingly demonstrated that a project would meet the applicable standards at a lesser distance due to unique terrain features or future improvements in turbine technology.

The original proposed rule allowed projects with capacities of 150 kW or below to rely on the rule's setback as an alternative to performing post-construction monitoring. The final proposed rule divides this group of projects into small and medium sizes, with the option to rely on setbacks instead of monitoring available to the medium-sized group, and with the small-sized group treated differently, as explained below. The medium-sized group of turbines is subject to a single 42 dBA limit. It is the Board's understanding that turbines of this size are incapable of operating in NRO mode and therefore cannot reduce sound levels other than through shutdowns. However, as is explained below for the small turbines, the medium turbines will tend to be sited

closer to receptors so that background sound levels at a receptor will increase as wind speeds at the turbine increase.

The Board was persuaded by comments that a small wind category should be created to allow different treatment from the larger turbine projects. With large turbines located on a ridgeline, residences located on the lee side of the mountain may be exposed to very little wind even though the wind is blowing strongly at higher elevations. The result is the ridgeline turbines producing at or near maximum sound levels with very low ambient levels at the residence below, making the turbine sounds noticeably audible. On the other hand, small turbines tend to be sited at the same elevation as and nearer to sound receptors than large turbines. As a result, when a small turbine is operating, the same amount of wind is blowing at receptor locations as is blowing at the turbine location. As wind speeds increase and a turbine produces more sound, ambient sound levels at nearby residences also increase and serve to partially mask the sound of the turbine. Small turbines also do not emit low-frequency sound or infrasound at the levels emitted by large turbines. Because of these differences, the Board was persuaded that there was no justification for imposing the same standards on small turbines as large turbines. As a result, the final proposed rule establishes a limit of 42 dBA at the nearest residences that must be met 95% of the time. The standard allows occasional levels above the 42 dBA limit because of the correlation between increases in turbine sound levels and background sound levels at the receptor location.

5.704 Pre-Construction Sound Modeling

Summary

This section requires that sound modeling be included with any petition for a wind generation facility with a capacity greater than 50 kW and describes the modeling information that must be included with the petition. The section requires that conservative assumptions be used in the inputs to the model and includes margins of error to account for uncertainties in the modeling process. The purpose of these conservative assumptions is to ensure that proposed projects are in fact capable of operating within the rule's sound limits. Turbine projects with a capacity up to 50 kW are not required to perform sound modeling. Instead, they may submit with their petition certain certification documents regarding expected sound levels and a simplified demonstration that sound pressure levels at the closest non-participating residences will be within the applicable limit.

Response to Comments

The Vermont Public Interest Research Group ("VPIRG") commented that the modeling requirements contain too many conservative assumptions, in particular the requirements that the model include uncertainty factors for turbine sound power levels and for the sound model itself. According to VPIRG, these requirements dictate that a project must be capable of actually operating at a sound level as low as 30 dBA in order to demonstrate compliance with the applicable limit through the modeling because the conservative assumptions required by this section will increase the sound levels calculated through the model.

On the other hand, Vermonters for a Clean Environment ("VCE") commented that the rule's allowance for a ground attenuation factor is inappropriate in mountainous terrain such as Vermont's, contending that ground attenuates sound only in flat terrain. VCE also recommends using a different model from the one specified in the proposed rule, asserting that it is more accurate.

The Department was generally supportive of the modeling approach and its conservative assumptions.

The Board has carefully considered both VPIRG's and VCE's comments and has decided to retain the section in its current form. The Board believes it is preferable to rely on conservative assumptions in modeling and realize a quieter project than what was modeled, than to set aside those assumptions and create the risk of a project that fails to comply with the applicable sound level limits even though modeling indicated that it would comply. The uncertainty levels for turbine sound power and the sound model itself are known, and the Board believes it is therefore appropriate to use them to err on the side of caution and avoid after-the-fact compliance enforcement actions. The Board was also persuaded by other commenters that some level of ground attenuation remains appropriate, even in Vermont. The allowed level of 0.5 is also in itself conservative. The Board believes that the allowed attenuation factor in combination with use of the sound power and modeling uncertainty levels will ensure that modeling results are conservative and highly likely to produce results than can be relied upon to ensure sound level compliance prior to construction so that post-construction complaints and complex enforcement actions can be minimized.

We also decline to accept VCE's recommendation that we use a different model. While the model indicated by the final proposed rule can be described as having some shortcomings when applied to modeling wind turbines, these shortcomings appear to be largely theoretical as the results of the model have been shown to be accurate when post-construction monitoring has been performed. This fact, coupled with the use of conservative assumptions, gives the Board confidence in the results that will be produced by the model selected. The model indicated by the rule also has the advantage of widespread use in the United States.

VPIRG also requested the following changes to this section:

- Change the term "maximum" to "full rated" throughout the section to be consistent with language in IEC 61400-11.
- In 5.705(F), now identified as section 5.704(B)(6) due to general reorganization of the rule, require that "potential compliance" testing locations be identified, since actual locations should be selected after construction, given changes to the surrounding landscape that can happen over time.
- Reduce the modeled receiver height from 4 meters to 4-5 feet to match the compliance testing microphone height.

The Board has considered VPIRG's requests and has accepted one, adding the term "potential" as a modifier to compliance testing locations. The Board declines to adopt the other two recommendations. First, the IEC standard does not use the phrase "full rated" and second,

the 4-meter modeled receiver height is appropriate because many bedrooms are located on second floors. However, the final proposed rule requires modeling at both 1.5 and 4 meters.

5.705 Post-Construction Sound Monitoring Applicability

Summary

This section establishes the applicability of post-construction monitoring requirements for the three size categories of turbine projects. Turbine projects up to 50 kW are not required to perform post-construction monitoring. However, the Board may require monitoring if it is determined that exceedances of the applicable sound-level limit are probable or as part of an investigation into one or more complaints. The rule does not detail the requirements for performing any such modeling because small turbines are different from medium and large turbines. As a result, the Board believes it is appropriate to develop monitoring protocols when required on a case-by-case basis.

Medium-size turbines and projects have the option to demonstrate compliance either through use of the rule's setbacks or through post-construction modeling.

Large-size turbines and projects are required to perform periodic post-construction modeling.

5.706 Post-Construction Sound Monitoring General Requirements

Summary

This section establishes the basic requirement for post-construction sound monitoring and makes clear that monitoring will be used both to establish facility compliance with the applicable sound limits and to verify the accuracy of the pre-construction sound modeling. The section requires that monitoring take place under the direct supervision of a state agency designated by the Board. This is intended to address concerns over the potential for turbine operators to influence the monitoring.

5.707 Post-Construction Sound Monitoring Methodology

Summary

This section establishes the procedures that must be followed when gathering sound data during a monitoring period. The section establishes requirements for personnel and equipment to be used in monitoring as well as requirements for the Board-approved monitoring locations. These requirements are intended to ensure that properly trained personnel and properly calibrated equipment are used in monitoring. The locational and equipment placement requirements are intended to minimize contamination from background sound levels in order to obtain a more accurate measurement of facility-only sound levels and to obtain worst-case scenario, turbine-only sound levels at receptor locations.

5.708 Determination of Background/Ambient Sound Levels

Summary

This is a new section and is needed to create a mechanism for determining background sound. It is consistent with the comments by participants who recommended the rule account for background sound when determining compliance with the applicable sound limits.

5.709 Post-Construction Sound Monitoring Measurements

Summary

This section identifies the data that must be monitored and measured and establishes a one-minute interval for sound, meteorological, and turbine operational data.

Response to Comments

The original proposed rule relied on a 10-minute measurement interval for collection of the required data. The Department was critical of the 10-minute interval because its length increased the possibility of contamination by transient events, such as a dog barking, a car passing by, or a plane flying overhead. Such transient contamination would result in having to discard the entire 10-minute sample, making collection of the required minimum number of samples difficult.

The Board has considered the Department's comments and decided to amend the proposed rule by decreasing the length of the measurement period to one minute and increasing the minimum number of valid samples to 120 for a calculation of the arithmetic average. Reducing the measurement interval will decrease the likelihood of individual measurements containing contaminated data; and, where a measurement period contains contaminated data, only a one-minute sample will need to be discarded rather than the 10-minute sample required under the original proposed rule.

Several commenters were critical of the proposed rule's use of averaging to determine compliance and instead advocated for an instantaneous limit known as "Lmax." Some of these commenters contend that a turbine operator will run a project at sound levels far above the applicable limit for a period of time, and then restrict operations for a period of time, thereby meeting the sound limit through averaging. Under the Lmax approach, an exceedance of the applicable limit as brief as a second or less would constitute a violation.

The Board disagrees with the use of Lmax for determining wind turbine compliance with sound limits. The Board believes that Lmax is more appropriate for compliance determinations of isolated or periodic loud sounds as opposed to the more continuous, steadier levels of sound from wind turbines. Additionally, because the decibel scale is logarithmic, loud sound events that are properly attributed to turbine-only sounds will have a greater impact on compliance results than quieter periods of time.

5.710 Post-Construction Sound Monitoring Data Analysis

Summary

This section sets forth the procedures for analysis of data gathered during post-construction monitoring. It classifies qualifying data samples as either "Ambient" or "Turbine On" and establishes a method for removing ambient sound levels measured when the turbines are turned off from total sound levels measured while the turbines are operating. This allows for a calculation of a turbine-only sound level for compliance purposes. Data samples that do not meet the specified qualifications are excluded from the analysis. The one-minute sound measurements are separated into "bins" based on one-meter-per-second increases in ground level wind speeds at the measurement location up to 5 meters per second (i.e. there are six bins, one for each meter-per-second from zero to five). The binning methodology allows an understanding of how turbine sound levels affect receptor locations at varying wind speeds. The section also requires a minimum of 120 valid one-minute intervals, which must be comprised of at least 40 valid intervals across at least three different bins. However, if the required minimum number of samples is not realized by the end of 10 weeks of monitoring, the agency overseeing the monitoring may either continue the monitoring or report its results up to that point with its recommendation to conduct additional monitoring, to monitor at a different location, or to rely on the monitoring performed to determine compliance with an explanation of why that is appropriate. The Board will then make a determination whether further monitoring is required based on the information and recommendation provided.

Response to Comments

The Department and RSG both strongly recommended that the original proposed rule be changed to account for the removal of background sound and transient contaminating events to more accurately identify turbine-only sound levels. There was concern that, while the approach in the original proposed rule could be used to accurately demonstrate compliance, it could not reliably demonstrate non-compliance, especially in the event of small exceedances of the limit because such a conclusion could always be challenged on the grounds that ambient levels were the actual cause of the violation. Additionally, monitoring would have to be performed based on weather forecasts and conditions on the ground could easily vary from what was forecast, making obtaining the required number of valid samples a potentially difficult and uncertain endeavor.

The original proposed rule required that monitoring be performed under certain meteorological conditions when ambient sound levels were expected to be insignificant in relation to turbine sound levels, thereby eliminating the need to account for background sound levels. However, after reviewing the Department's and RSG's comments the Board was persuaded that the Department's proposal was appropriate and has included it in the final proposed rule. This should both produce more accurate results and allow for an increased likelihood of a measurement campaign meeting the required minimums for valid measurement samples.

5.711 Compliance Data Collection, Measurement, and Retention Procedures

Summary

This section establishes the requirements for data collection and retention and sets forth the schedule on which monitoring must occur. Monitoring must occur during the first year of project operations and every five years thereafter. The first-year monitoring includes a requirement for sound-power testing, which tests the sound level actually being produced by the turbine as opposed to the sound level being experienced at a receptor location. This requirement will help the Board assess complaints that turbines have become louder over time by establishing a baseline the Board can use for comparison to sound-power levels measured at a future date. The section also allows for the Board to order additional monitoring in response to complaints on a case-by-case basis.

Response to Comments

Several commenters object to the periodic monitoring requirements established by the rule and recommend that full-time, continuous monitoring with access to real-time data for the life of a project be required for assessing compliance. These recommendations are largely based on a concern that turbine operators might scale back operations during monitoring periods to achieve compliance, and then scale up operations when monitoring is not being performed, thereby operating above the allowable limits much of the time. This in turn would require turbine neighbors to act as enforcers by complaining to the Board, with resolution of compliance questions coming potentially long after the fact.

The Board appreciates these concerns but does not believe that full-time, continuous monitoring is needed to reliably determine compliance. A petitioner for a CPG for a wind facility must demonstrate through conservative modeling that a project will meet the applicable limits and the monitoring is used in part to confirm the accuracy of the modeling. The conservative assumptions used by the rule for modeling mean it is more likely that a project will operate at a slightly lower level than its modelling indicated. Additionally, under the rule, monitoring will be performed under the supervision of a state agency that has access to operational information from the facility being monitored. Thus, any reductions in facility operations during a monitoring campaign would be readily apparent. Lastly, the requirement for periodic monitoring at five-year intervals will ensure that if a project becomes louder over time, any non-compliance will be captured.

5.712 Reporting of Compliance Measurement Data

Summary

This section requires that sound-monitoring reports be filed with the Board no later than 60 days after the completion of the monitoring period.

Response to Comments

Some commenters would like to have the sound-monitoring reports submitted earlier than 60 days. While the Board appreciates the concept of a shorter time period, a significant amount of data analysis is required to reach a conclusion about facility-only sound levels following a monitoring campaign. Accordingly, the Board believes a maximum 60-day period is reasonable.

5.713 Complaint Response Procedures

Summary

This section requires CPG holders to respond to complaints about sound consistent with the complaint response procedures developed by the Department.

Response to Comments

Several commenters understood this section to require that all complainants follow the Department's complaint resolution procedure. That was not the Board's intent. It was the Board's intent to require only CPG holders to respond to complaints in that manner. Nothing in the rule prevents the Board from acting in response to a complaint filed directly with the Board or to act on its own in the event it has information that warrants action. Minor edits were made to the language of the section to clarify this intent.

Annotated Text

5.700 ~~TEMPORARY~~ RULE ON SOUND LEVELS FROM WIND GENERATION FACILITIES

5.701 Purpose and Applicability

This ~~temporary~~ rule establishes standards and procedures related to sound emissions from wind generation facilities that apply for a certificate of public good ("CPG") pursuant to 30 V.S.A. §~~-~~ 248 or § 8010 on or after ~~June 13, 2016~~July 1, 2017.

5.702 Definitions

~~(A)~~ For the purposes of this Rule, the following definitions shall apply:

Board: the Vermont Public Service Board~~.~~

Contributing turbines: the turbine or group of turbines at a wind generation facility whose removal from a facility sound model results in a residual project-only predicted sound pressure level at the receptor of less than 30 dBA or a reduction in predicted turbine contribution of at least 6 dB at the point of measurement

CPG: certificate of public good

CPG Holder: a person or company who has received a CPG pursuant to 30 V.S.A. § 248 or § 8010 for a wind generation facility

dB: a unit used to measure the intensity of a sound wave using a logarithmic scale

dBA: A-weighted decibel ~~(B)~~

Department: the Vermont Department of Public Service~~.~~

~~(C)~~ L_{A10}: Sound level exceeded during 10% of a measurement period

L_{A50}: Sound level exceeded during 50% of a measurement period

L_{A90}: Sound level exceeded during 90% of a measurement period

L_{eq}: Continuous sound level in dB equivalent to the total sound energy over a given period of time

NRO mode: Noise Reduced Operation mode, in which the rotational speed of wind turbines is limited in order to reduce their sound emissions

Participating landowner: a landowner who has signed a written agreement with a Petitioner stating that the sound emission and setback standards established by this rule do not apply to the landowner's property

Petitioner: a person or company who has filed a petition for a CPG pursuant to 30 V.S.A. § 248 or 8010 to construct and/or operate a wind generation facility

Plant capacity: pursuant to 30 V.S.A. § 8002, "plant capacity" means the rated electrical nameplate for a wind generation facility~~.~~

~~(D)~~ Residence: a permanent structure for human habitation that is occupied by one or more people for a minimum of 90 days each year~~.~~

~~(E) Turbine shut-down method: a sound monitoring method used to determine background sound levels by having all turbines that have a measureable effect on sound levels at a specific monitor location cease operation for a specified period of time.~~

~~(F)~~ SCADA: supervisory control and data acquisition or similar system capable of measuring and recording turbine operation and meteorological data in one-minute time intervals

~~dBA: A-weighted decibel.~~

~~(G) L90: Sound level exceeded during 90% of a measurement period.~~

~~(H)~~ Wind generation facility:- a wind-driven electric generation facility for which a petition for a CPG pursuant to 30 V.S.A. § 248 or § 8010 is submitted to the Board on or after ~~June 13, 2016.~~July 1, 2017

~~(I) CPG holder: a person or company who has received a CPG pursuant to 30 V.S.A. § 248 for a wind generation facility.~~

5.703 General Rule

~~Until a final rule establishing sound standards related to the operation of wind generation facilities is adopted, no~~ No wind generation facility ~~approved for operation~~ shall emit sound levels in excess of the following during operation:

~~(A)~~Facilities with a plant capacity ~~of 500~~up to and including 50 kilowatts ~~or less~~. Operation of facilities with a plant capacity ~~of 500~~up to and including 50 kilowatts ~~("kW") or less~~ shall not result in: (1) ~~audible prominent discrete frequency tones pursuant to the latest revision of ANSI standard S12.9 Part 4 Annex C at any residence; and (2)~~ sound pressure levels ~~in excess of 10 dBA above L90 ambient level at the exterior of any residence, or 45 dBA when measured at the exterior of any residence, whichever is less. The measurement time interval shall be established on a case-by-case basis as part of the Board's review of an application for a CPG. In no instance shall the measurement time interval~~that exceed ~~one hour.~~

~~(B)~~(A) ~~Facilities with a plant capacity of greater than 500 kW. Operation of facilities with a plant capacity of greater than 500 kW shall not result in:~~ (1~~42 dBA more than 5% of the time at a distance of 100 feet from the residence of a non-participating landowner; or (2)~~ audible prominent discrete-frequency tones pursuant to the latest revision of ANSI ~~standard S12.9 Part 4 Annex C at any residence; and (2) sound pressure levels in excess of 45 dBA at the exterior of any residence or 30 dBA in an interior bedroom. The measurement time interval shall be established on a case-by-case basis as part of the Board's review of an application for a CPG. In no instance shall the measurement time interval exceed one hour. For purposes of determining the interior sound pressure levels specified under this section, residences shall be presumed to have their windows open during the months of May, June, July, August, and September, shall be presumed to have their windows partially open during the months of April and October, and shall be presumed to have windows closed during the remaining months~~S1.13 Annex A at a distance of 100 feet from the residence of a non-participating landowner.

~~(C) The Board shall evaluate appropriate sound standards for proposed wind generation facilities on a case-by-case basis, and may impose lower sound pressure levels, or different measurement metrics, as appropriate, based on the evidence presented as part of the Board's review of an application for a CPG.~~

(B) Facilities with a plant capacity greater than 50 and up to and including 150 kilowatts. Operation of facilities with a plant capacity greater than 50 kilowatts and up to and including 150 kilowatts shall not result in sound pressure levels in excess of 42 dBA,

including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner.

(C) Facilities with a plant capacity greater than 150 kilowatts. Operation of facilities with a plant capacity greater than 150 kW shall not result in sound pressure levels in excess of 42 dBA between the hours of 7 A.M. and 9 P.M. or 39 dBA between the hours of 9 P.M. and 7 A.M., including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner. Each turbine and any sound-producing equipment located within the footprint of the turbine array shall be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner. This minimum setback requirement may be waived on a case-by-case basis for good cause shown.

5.704 Pre-Construction Sound Modeling

(A) ~~All~~Facilities with a plant capacity up to and including 50 kilowatts. In lieu of submitting sound modeling pursuant to Section 5.704(B), below, petitions to construct and operate a wind generation facility~~, except for~~ with a plant capacity up to and including 50 kilowatts may instead file the following information with its petition:

1. All certification documents from the Small Wind Certification Council showing the results of acoustic sound testing;

2. The distance to the nearest residence(s) in each cardinal direction, as well as an analysis of the expected sound pressure level at those ~~for~~residences calculated using spherical spreading.

(B) Facilities with a plant capacity of more than 50 kilowatts. All petitions to construct and operate a wind generation facility with a plant capacity of more than 50 kW ~~or less,~~ shall include a sound model developed for the proposed facility that reports the expected maximum project sound pressure levels ~~experienced~~, without using NRO mode, modeled out to a distance where such levels are no greater than 30 dBA. A petitioner must submit the following information with its petition:

1. A map depicting the location of all proposed sound sources associated with the wind generation facility, property boundaries for the proposed facility, and all residences within ~~a specified radius from the nearest turbine. For facilities with capacities larger than 50 kW and equal to or less than 500 kW, the radius shall be one mile. For facilities with capacities larger than 500 kW, the radius shall be three miles~~the 30 dBA contour.

~~(A)~~2. ~~Turbine specifications as the basis of sound model.~~A description of the major sound sources, including tonal sound sources, associated with operation and maintenance of the facility. The sound model shall be based on the technical specifications of the ~~turbines proposed~~ turbine model(s) with the

highest manufacturer apparent sound power level under consideration for use at the facility.

~~(B) Other Inputs to Sound Model. The sound model shall be based on the most conservative set of inputs and assumptions appropriate for the facility and shall include information identifying the inputs and assumptions related to:~~

~~(1) Uncertainty of sound power from the facility;~~

~~(2) Ground absorption of sound; and~~

~~(3) Topographic and geographic features unique to the facility, including bodies of water.~~

3. ~~Obligation to update and supplement sound model.~~ AThe results of sound modeling pursuant to ISO 9613-2, including a description of the equivalent continuous sound levels expected to be produced by the sound sources at a distance of 100 feet from the residences of non-participating landowners. The description shall include a full-page isopleths map depicting the predicted sound pressure levels expected to be produced by the wind generation facility at a distance of 100 feet from each residence of a non-participating landowner within the 30 dBA isopleth. The predictive model used to generate the equivalent sound levels expected to be produced by the sound sources shall be designed to represent the "predictable worst case scenario." All model inputs shall be the most realistic and conservative available for each of the items listed below unless otherwise approved by the Board, and shall include, at a minimum, the following:

a. The maximum apparent sound power output of the sound sources pursuant to IEC 61400-11;

b. Modeling in accordance with ISO 9613-2, with each turbine modeled as a point source at hub height;

c. All turbines operating at maximum apparent sound output;

d. Attenuation due to air absorption, with conditions set to 10°C and 70% relative humidity;

e. Attenuation due to ground absorption/reflection, based on mixed ground conditions (G=0.5) for propagation over land and hard conditions (G=0.0) for propagation over water;

f. Attenuation due to three-dimensional terrain;

g. Receiver height modeled at both 1.5 and 4 meters;

h. Attenuation due to meteorological factors such as relative wind speed and direction (wind rose data), temperature/vertical profiles and

relative humidity, sky conditions, and atmospheric profiles;

i. An adjustment to the maximum apparent sound power output of the turbines to account for turbine manufacturer uncertainty, determined in accordance with the most recent version of the IEC 61400-11 standard; and

j. A disclosure of the model's error, which is intended to account for uncertainties in the modeling of sound propagation for wind energy developments. This error shall be accounted for and incorporated as an addition to the full rated output of the sound sources.

4. A description of proposed major sound control measures, including their locations and expected acoustical performance;

5. A comparison of the expected sound pressure levels from the proposed wind generation facility with the applicable sound pressure level limits of Section 5.703;

6. A description and map identifying potential compliance testing locations on or near the proposed wind generation facility site. The identified compliance testing locations shall be selected to take advantage of prevailing downwind conditions and shall be able to meet the site selection criteria outlined in Section 5.707. The identified locations shall include those locations that are expected to experience the highest model-predicted equivalent sound levels. The locations shall be free from sources of material sound contamination.

~~(C)~~7. Prior to commencing site preparation or construction of a facility, a CPG Holder shall update, supplement, and/or amend the sound ~~model due~~modeling to reflect any ~~and all~~ changes to the sound-producing elements of the facility ~~prior to operation~~. An opportunity to review and comment on any change to the sound ~~model~~modeling, and to request a hearing, shall be given to all parties to the 30 V.S.A. § 248 proceeding who ~~have~~had standing on the issue of sound. ~~The~~ The Board may, in its discretion, grant a hearing if a party who had standing on the issue of sound demonstrates that the revised sound modeling represents a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703. If the Board holds a hearing, the CPG Holder ~~must receive Board approval of any changes to the sound model prior to commencing~~may not commence site preparation or construction of the facility until the Board resolves the issue.

5.705 Post-Construction Sound Monitoring Applicability

(A) ~~For a wind generation facility~~ Facilities with a plant capacity up to and including 50 kilowatts. Post-construction sound monitoring may be required by the Board for a facility in this category if it is determined that exceedances of the applicable sound-level limit are probable or as part of an investigation into one or more complaints.

(B) Facilities with a plant capacity greater than ~~500 kW, sound~~50 and up to and including 150 kilowatts. Sound monitoring shall take place in accordance with Section 5.707, below, or pursuant to an alternative monitoring plan adopted in the facility's CPG. In lieu of verifying compliance with the applicable sound-level limit through sound monitoring, a petitioner may propose to locate a wind generation facility in this category such that every sound-producing element of the facility within the turbine footprint will be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner.

(C) Facilities with a plant capacity greater than 150 kilowatts. Sound monitoring shall take place during the times specified in section 5.711, in accordance with the requirements of this rule and any requirements of the CPG, which shall specify the minimum number of ~~residences to be monitored~~compliance monitoring locations, the radius from the nearest facility turbine in which monitoring locations may be selected, and the time period of monitoring. The monitoring ~~is intended~~will be used to verify the accuracy of the pre-construction modeling and facility compliance with CPG conditions and the requirements~~. At~~ of this rule. In addition to the requirements of this rule and the CPG, the Board may, at its discretion, ~~the Board may~~ require additional monitoring ~~based on~~if the results of the initial post-construction sound monitoring or ~~as a result of~~ changes to the facility or its operation indicate that exceedances of the sound-level limit are probable.

5.706 Post-Construction Sound Monitoring General Requirements

(A) Monitoring by the State. Post-construction sound monitoring shall be conducted under the direct supervision and control of a State of Vermont agency or agencies designated by the Board. The post-construction sound monitoring shall be paid for by the CPG Holder.

~~(B) Monitoring methodology. Post-construction sound monitoring shall conform to the requirements contained in Rule 5.706.~~

(B) Monitoring locations. A petition for a CPG for a wind generation facility shall include proposed monitoring locations for post-construction monitoring. The proposed locations shall include residential locations that are expected to experience the highest model-predicted equivalent sound levels and are consistent with the requirements of Section 5.707. The proposed locations shall be free from sources of material sound contamination. Any change in monitoring locations must be approved in advance by the Board.

(C) Modification of pre-construction sound ~~model~~modeling. A CPG Holder is required to identify the appropriate inputs and/or assumptions, and modify the pre-construction sound ~~model~~modeling if the post-construction sound monitoring indicates that there is a reasonable likelihood that the expected ~~maximum~~highest sound levels at any of the

monitoring locations ~~are~~would be equal to or greater than 3 dBA above those modeled~~.~~, or would result in an exceedance of the sound level standard specified in Section 5.703. All parties to the 30 V.S.A. § 248 or § 8010 proceeding in which a CPG was granted who ~~have~~had standing on the issue of sound shall be given an opportunity to review and comment on any change to the sound ~~model~~modeling. The Board may, in its discretion, grant a hearing if a party who had standing on the issue of sound demonstrates that the revised sound modeling indicates a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703.

~~(D) Alternatives to residential monitor locations. A CPG Holder may seek a waiver from the minimum residence monitoring location requirement if sufficient residential locations cannot be secured to conduct sound monitoring. A request for waiver shall include a description of why the CPG Holder is unable to meet the minimum residence requirement, and the efforts it has taken to meet the requirement. The request for waiver shall also include a description of the proposed alternative monitoring location(s).~~

5.~~706~~707 Post-Construction Sound Monitoring Methodology

~~Sound monitoring equipment and procedures shall conform to all applicable relevant industry standards and specifications. Sound monitoring shall include periods when at least 90% of the facility's wind turbines are expected to be operating at their maximum sound power.~~

(A) ~~Monitoring equipment specifications.~~Measurement personnel. Measurements shall be supervised by personnel who are well qualified by training and experience in measurement and evaluation of environmental sound. Certification through the Institute of Noise Control Engineering shall meet the qualification requirements of this section.

~~(A)~~(B) Measurement instrumentation. The sound meter or alternative sound measurement system used shall meet all appropriate industry standards and specifications. ~~Each monitoring site shall include~~Each monitoring site shall include installation of an anemometer and other equipment or sensors capable of gathering and recording weather conditions at the microphone (10-meter-level wind speed, wind direction, temperature, humidity, and precipitation) and be equipped with enhanced-performance windscreens capable of significantly reducing or eliminating wind-induced noise contamination over the microphone. The measurement instrumentation shall meet the following specifications unless otherwise approved by the Board:

~~Installation of an~~

1. The sound level meter or alternative sound level measurement system shall meet the Type 1 performance requirements of American National Standard Specifications for Sound Level Meters, ANSI S1.4.

2. The integrating sound level meter (or measurement system) shall also meet the Type 1 performance requirements for integrating/averaging in the International Electrotechnical Commission Standard on Integrating-Averaging

Sound Level Meters, IEC Publication 61672-1.

3. The filter for determining the existence of tonal sounds shall meet all the requirements of the American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters, ANSI S1.11 and IEC 61260, Type 3-D performance.

4. The acoustical calibrator shall be of a type recommended by the manufacturer of the sound level meter and one that meets the requirements of American National Standard Specification for Acoustical Calibrators, ANSI S1.40.

5. Anemometer(s) for surface (10 meter (m)) (32.8 feet) wind speeds shall have a minimum manufacturer specified accuracy of ±1 mph providing data in 10-second integrations and 10-minute average/maximum values for the evaluation of atmospheric stability.

6. Audio recording devices shall be time stamped (hh:mm:ss), recording the sound signal output from the measurement microphone to be used for identifying events. Audio recording and compliance data collection shall be measured through the same microphone/sound meter and bear the same time stamp.

(C) Equipment calibration.

1. The sound level meter shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign, and the microphone's response shall be traceable to the National Institute of Standards and Technology.

2. Field calibrations shall be recorded and documented in compliance monitoring reports.

3. The 10-meter anemometer(s) and vane(s) shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign.

(D) Compliance measurement location, configuration, and environment.

1. Compliance measurement locations shall be approved by the Board during its review of a facility's request for a CPG and shall be representative of the non-participating residences expected to experience the highest model-predicted facility-only sound levels from routine operation of the wind generation facility, subject to permission from the respective property owner(s). Measurement locations shall reasonably be expected to experience downwind conditions from acoustically significant turbines and shall be free from significant sources of sound contamination, such as high-traffic roadways, industrial or silvicultural activity, etc.

a. To the greatest extent possible, compliance measurement locations shall be at the center of unobstructed areas that are maintained free of vegetation and other structures or material that is greater than 2 feet in height for a 75-foot radius around the sound and audio monitoring equipment ~~or sensors capable of gathering and recording sound meter level~~.

b. To the greatest extent possible, meteorological measurement locations shall be at the center of open flat terrain, inclusive of grass and minimum number of obstacles that are greater than 6 feet in height for a 250-foot radius around the anemometer location. Meteorological measurements shall be taken at the monitoring location at or above the height of the audio/acoustic microphone.

~~(1)~~c. Meteorological measurements of wind speed~~, wind~~ and direction~~, temperature, and precipitation; and~~ shall be collected using anemometers at a 10-meter height (32.8 feet) above the ground. Results shall be reported, based on 10-second integration intervals, synchronously with turbine nacelle measurements and measurements made at the sound-meter level at one-minute measurement intervals. The wind speed average and maximum for each one-minute interval shall be reported.

d. The sound microphone shall be positioned at a height of approximately 1.5 meters above the ground, and oriented in accordance with the manufacturer's recommendations.

e. When possible, measurement locations should be at least 50 feet from any sound source. The proposed locations shall be free from sources of material sound contamination. Any non-facility sources of sound shall be noted in the analysis.

~~(2) 5.708 Installation of enhanced wind screens capable of significantly reducing or eliminating wind-induced noise contamination over the sound meter.~~

Determination of ~~background~~/Background/Ambient Sound Levels

~~(B)~~ In order to determine the ambient sound levels~~. Activities conducted to determine background sound levels shall conform to the following methodologies:~~

~~(1)~~ at a receptor, turbine shutdowns will be required as part of post-construction sound monitoring. A CPG ~~holder~~Holder shall conduct turbine shutdowns in accordance with the requirements of its CPG~~, which~~. The CPG shall specify the minimum number and duration of turbine shutdowns during ~~each month of~~ the post-construction sound monitoring ~~program~~. The ~~CPG shall also specify the number of required~~ timing of turbine shutdowns ~~to occur during nighttime hours.~~

~~(2)~~ ~~A CPG holder shall place, where feasible, both~~shall be determined by the State of

Vermont agency overseeing post-construction sound monitoring in consultation with the project operator. In the event that turbine shutdowns are technically infeasible, background sound levels may be determined using a primary and shielded secondary sound ~~meters or alternative sound measurement systems at the sound monitoring location, consistent with appropriate industry standards and specifications~~level meter.

5.709~~Additional~~ Post-construction Sound Monitoring ~~Methodology: Additional~~Specific Measurements

The following data shall be measured and recorded in one-minute increments:

(A) Acoustic parameters:

1. Overall L_{Aeq} (20-20,000 Hz);

2. Unweighted 1/3rd octave spectra (20-20,000 Hz);

3. Narrowband spectra (20-4,000 Hz, 1-Hz resolution, hanning window).

(B) Meteorological data. All meteorological data as specified in Section 5.712 shall be measured and recorded synchronously with the acoustic parameters listed in Section 5.709(A)1, above.

(C) Turbine operational data including power output, rotor rotational speed, and the meteorological data listed in Section 5.707.

5.710 Post-Construction Sound Monitoring Data Analysis

(A) All recorded data shall be categorized as "Turbine On" or "Ambient," or shall be excluded.

1. Turbine On data shall meet the following criteria:

   a. All Contributing Turbines for a specific receptor shall be operational. The minimum power output for each Contributing Turbine shall be specified in the project's CPG.

   b. The monitoring ~~methodologies~~location receptor shall be within 45° of the direction between a specific measurement location and the acoustic center of the five nearest wind turbines, or fewer if the wind generation facility does not have five wind turbines.

2. Ambient data shall be categorized as such only when all Contributing Turbines are shut down or generating less than 1% of nameplate capacity.

3. Data meeting any of the following criteria shall be excluded from analysis:

   a. Data that cannot be categorized as Turbine On or Ambient;

b. Periods between 10 minutes prior to and one hour after precipitation at the monitoring location is detected;

c. Intervals contaminated by transient ambient sound sources, such as passing cars, barking dogs, etc.;

d. Periods when 10-meter wind speed is greater than 5 meters per second.

(B) Additional frequency-based filtering of the data may be performed if unique conditions at the monitoring location(s) justify such action. In such an instance, the designated individual, agency, or company responsible for sound monitoring data analysis shall notify the Board of the intent to apply additional filtering to an identified ~~and~~ set of data and the basis for such action. An opportunity to review and comment on any proposed additional filtering shall be given to all parties to the 30 V.S.A. § 248 or § 8010 proceeding in which a CPG was granted who had standing on the issue of sound prior to the commencement of any additional filtering.

(C) Filtered sound monitoring data shall be analyzed consistent with the following protocols.

1. Overall sound levels shall be derived using the following methodology:

a. Filtered one-minute L_{Aeq} sound levels shall be separated into Turbine On and Ambient datasets.

b. Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.

c. Mean average Turbine On and Ambient sound level shall be computed in each wind bin.

d. The average Ambient sound level shall be logarithmically subtracted from the average Turbine On sound level in each wind bin to derive the project-only sound level.

e. Wind bin averages shall not be reported if the difference between the Turbine On average sound level and Ambient sound level in a wind bin is less than 3 dBA.

2. Sound monitoring data analysis shall be based on a minimum of 120 filtered one-minute L_{Aeq} data points. In the event that 20 valid data points in each of the six wind bins are not available, wind bin averages may be reported when there are a minimum of 40 one-minute L_{Aeq} sound levels in at least three wind bins. If sufficient valid data are not obtained after ten (10) weeks of monitoring, the State of Vermont agency designated by the Board shall

provide a status update and recommendation for any additional monitoring to the Board.

3. Tonality shall be determined ~~on a case-by-case basis as part of the Board's review of a proposed facility~~ and applied to the overall sound level using the following methodology.

a. Filtered narrowband spectra shall be separated into Turbine On and Ambient datasets.

b. Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.

~~(C)~~c. The overall average tonal audibility for each wind bin shall be calculated pursuant to ~~Section 248~~the methodology contained in IEC 61400-11 or the latest revision of the same.

~~5.707 Analysis of Sound Monitoring Data~~

~~d. Methodologies, protocols, and/or practices for analyzing recorded sound levels at a facility and/or post-construction monitoring sites shall be identified and determined on a case-by-case basis as part of the Board review of any proposed facility under 30 V.S.A. § 248~~If tonal audibility in any wind bin is greater than 2 dB, a penalty to the project-only sound level in that wind bin shall be applied pursuant to ISO 1996-2, Figure C.1 or the latest revision of the same.

5.711 Compliance Data Collection, Measurement, and Retention Procedures

(A) All operational, sound, audio, and meteorological data collected shall be retained by the State of Vermont agency or agencies designated by the Board for the life of the project and subject to inspection upon request.

(B) Monitoring and data collection shall occur at a minimum:

1. Once during the first year of facility operation, including sound power testing pursuant to IEC 61400-11 for each turbine;

2. Once during each successive fifth year thereafter until the facility is decommissioned; and

3. In response to a complaint if ordered by the Board. The Board in its discretion may require additional sound monitoring or sound power testing for a wind generation facility in response to a complaint if the Board determines that a complaint raises a reasonable possibility that a wind generation facility is operating in excess of the sound level limits required by this rule. In making its determination, the Board shall consider:

a. The details of the complaint;

b. Any response thereto filed by the operator of the wind generation facility; and

c. Any response and recommendation by the Department of Public Service after its review of the complaint, the facility operator's response, and any attempts made to resolve the complaint under the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.). As part of any recommendation, the Department may propose a plan for additional sound monitoring or sound power testing of the subject wind generation facility. Any such proposal should incorporate the requirements and standards set forth in subsection (b), below, or set forth an explanation why different requirements and standards are being proposed.

(C) All relevant turbine operational data (SCADA); the date, time, and duration of any NRO or other operational changes that occur during the sound monitoring period; and sound level and meteorological data collected during a compliance measurement period that meets or exceeds the specified wind speed parameters shall be submitted by the State of Vermont agency or agencies designated by the Board to the Board for review and approval. All data shall be submitted to the Board within 60 days of completion of the monitoring period as part of the post-monitoring report. Audio recordings will only be submitted upon request and may be filtered to exclude private conversations and/or submitted under a confidentiality order.

5.712 Reporting of Compliance Measurement Data Compliance reports shall be submitted to the Board within 60 days of the completion of the sound monitoring period. The Board will make the report publicly available. The report shall include a certification that the required monitoring conditions were present and, at a minimum, the following:

(A) A narrative description of the sound from the wind generation facility for the compliance measurement period;

(B) The dates, days of the week, and hours of the day when measurements were made;

(C) The wind direction and speed, temperature, humidity, and sky condition;

(D) Identification of all measurement equipment by make, model, and serial number;

(E) All meteorological, sound, windscreen, and audio instrumentation specifications and calibrations;

(F) All A-weighted equivalent sound levels for each 1-minute measurement interval;

(G) Short-period sound level measurements (50 milliseconds or less);

(H) All L_{A10}, L_{A50}, and L_{A90} percentile levels;

(I) All 1-minute 1/3 octave band unweighted and equivalent continuous sound levels (dB);

(J) Should any sound data collection be observed by a trained attendant, a summary of the attendant's notes and observations;

(K) All concurrent time-stamped, turbine-operational data including the date, time, and duration of any noise-reduction operation or other interruptions in operations, if present; and

(L) All other information determined necessary by the Board.

~~b.~~ **5.713 Complaint**

~~**5.708 Response to Complaints**~~**Procedures**

~~Complaints~~ CPG Holders shall respond to complaints raised by residents located near the wind generation facility ~~shall be responded to~~ in a manner consistent with the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.)

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5.700 RULE ON SOUND LEVELS FROM WIND GENERATION FACILITIES

5.701 Purpose and Applicability

This rule establishes standards and procedures related to sound emissions from wind generation facilities that apply for a certificate of public good ("CPG") pursuant to 30 V.S.A. § 248 or § 8010 on or after July 1, 2017.

5.702 Definitions

For the purposes of this Rule, the following definitions shall apply:

Board: the Vermont Public Service Board

Contributing turbines: the turbine or group of turbines at a wind generation facility whose removal from a facility sound model results in a residual project-only predicted sound pressure level at the receptor of less than 30 dBA or a reduction in predicted turbine contribution of at least 6 dB at the point of measurement

CPG: certificate of public good

CPG Holder: a person or company who has received a CPG pursuant to 30 V.S.A. § 248 or § 8010 for a wind generation facility

dB: a unit used to measure the intensity of a sound wave using a logarithmic scale

dBA: A-weighted decibel

Department: the Vermont Department of Public Service

L_{A10}: Sound level exceeded during 10% of a measurement period

L_{A50}: Sound level exceeded during 50% of a measurement period

L_{A90}: Sound level exceeded during 90% of a measurement period

L_{eq}: Continuous sound level in dB equivalent to the total sound energy over a given period of time

NRO mode: Noise Reduced Operation mode, in which the rotational speed of wind turbines is limited in order to reduce their sound emissions

Participating landowner: a landowner who has signed a written agreement with a Petitioner stating that the sound emission and setback standards established by this rule do not apply to the landowner's property

Petitioner: a person or company who has filed a petition for a CPG pursuant to 30 V.S.A. § 248 or 8010 to construct and/or operate a wind generation facility

Plant capacity: pursuant to 30 V.S.A. § 8002, "plant capacity" means the rated electrical nameplate for a wind generation facility

Residence: a permanent structure for human habitation that is occupied by one or more people for a minimum of 90 days each year

SCADA: supervisory control and data acquisition or similar system capable of measuring and recording turbine operation and meteorological data in one-minute time intervals

Wind generation facility: a wind-driven electric generation facility for which a petition for a CPG pursuant to 30 V.S.A. § 248 or § 8010 is submitted to the Board on or after July 1, 2017

5.703 General Rule

No wind generation facility shall emit sound levels in excess of the following during operation:

(A) Facilities with a plant capacity up to and including 50 kilowatts. Operation of facilities with a plant capacity up to and including 50 kilowatts shall not result in: (1) sound pressure levels that exceed 42 dBA more than 5% of the time at a distance of 100 feet from the residence of a non-participating landowner; or (2) audible prominent discrete-frequency tones pursuant to the latest revision of ANSI S1.13 Annex A at a distance of 100 feet from the residence of a non-participating landowner.

(B) Facilities with a plant capacity greater than 50 and up to and including 150 kilowatts. Operation of facilities with a plant capacity greater than 50 kilowatts and up to and including 150 kilowatts shall not result in sound pressure levels in excess of 42 dBA, including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner.

(C) Facilities with a plant capacity greater than 150 kilowatts. Operation of facilities with a plant capacity greater than 150 kW shall not result in sound pressure levels in excess of 42 dBA between the hours of 7 A.M. and 9 P.M. or 39 dBA between the hours of 9 P.M. and 7 A.M., including any penalty for tonality pursuant to Section 5.710, at a distance of 100 feet from the residence of a non-participating landowner. Each turbine and any sound-producing equipment located within the footprint of the turbine array shall be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner. This minimum setback requirement may be waived on a case-by-case basis for good cause shown.

5.704 Pre-Construction Sound Modeling

(A) Facilities with a plant capacity up to and including 50 kilowatts. In lieu of submitting sound modeling pursuant to Section 5.704(B), below, petitions to construct and operate a wind generation facility with a plant capacity up to and including 50 kilowatts may instead file the following information with its petition:

1. All certification documents from the Small Wind Certification Council showing the results of acoustic sound testing;

2. The distance to the nearest residence(s) in each cardinal direction, as well as an analysis of the expected sound pressure level at those residences calculated using spherical spreading.

(B) Facilities with a plant capacity of more than 50 kilowatts. All petitions to construct and operate a wind generation facility with a plant capacity of more than 50 kW shall include a sound model developed for the proposed facility that reports the expected maximum project sound pressure levels, without using NRO mode, modeled out to a

distance where such levels are no greater than 30 dBA. A petitioner must submit the following information with its petition:

1. A map depicting the location of all proposed sound sources associated with the wind generation facility, property boundaries for the proposed facility, and all residences within the 30 dBA contour.

2. A description of the major sound sources, including tonal sound sources, associated with operation and maintenance of the facility. The sound model shall be based on the technical specifications of the turbine model(s) with the highest manufacturer apparent sound power level under consideration for use at the facility.

3. The results of sound modeling pursuant to ISO 9613-2, including a description of the equivalent continuous sound levels expected to be produced by the sound sources at a distance of 100 feet from the residences of non-participating landowners. The description shall include a full-page isopleths map depicting the predicted sound pressure levels expected to be produced by the wind generation facility at a distance of 100 feet from each residence of a non-participating landowner within the 30 dBA isopleth. The predictive model used to generate the equivalent sound levels expected to be produced by the sound sources shall be designed to represent the "predictable worst case scenario." All model inputs shall be the most realistic and conservative available for each of the items listed below unless otherwise approved by the Board, and shall include, at a minimum, the following:

    a. The maximum apparent sound power output of the sound sources pursuant to IEC 61400-11;

    b. Modeling in accordance with ISO 9613-2, with each turbine modeled as a point source at hub height;

    c. All turbines operating at maximum apparent sound output;

    d. Attenuation due to air absorption, with conditions set to 10°C and 70% relative humidity;

    e. Attenuation due to ground absorption/reflection, based on mixed ground conditions (G=0.5) for propagation over land and hard conditions (G=0.0) for propagation over water;

    f. Attenuation due to three-dimensional terrain;

    g. Receiver height modeled at both 1.5 and 4 meters;

    h. Attenuation due to meteorological factors such as relative wind speed

and direction (wind rose data), temperature/vertical profiles and relative humidity, sky conditions, and atmospheric profiles;

i. An adjustment to the maximum apparent sound power output of the turbines to account for turbine manufacturer uncertainty, determined in accordance with the most recent version of the IEC 61400-11 standard; and

j. A disclosure of the model's error, which is intended to account for uncertainties in the modeling of sound propagation for wind energy developments. This error shall be accounted for and incorporated as an addition to the full rated output of the sound sources.

4. A description of proposed major sound control measures, including their locations and expected acoustical performance;

5. A comparison of the expected sound pressure levels from the proposed wind generation facility with the applicable sound pressure level limits of Section 5.703;

6. A description and map identifying potential compliance testing locations on or near the proposed wind generation facility site. The identified compliance testing locations shall be selected to take advantage of prevailing downwind conditions and shall be able to meet the site selection criteria outlined in Section 5.707. The identified locations shall include those locations that are expected to experience the highest model-predicted equivalent sound levels. The locations shall be free from sources of material sound contamination.

7. Prior to commencing site preparation or construction of a facility, a CPG Holder shall update, supplement, and/or amend the sound modeling to reflect any changes to the sound-producing elements of the facility. An opportunity to review and comment on any change to the sound modeling, and to request a hearing, shall be given to all parties to the 30 V.S.A. § 248 proceeding who had standing on the issue of sound. The Board may, in its discretion, grant a hearing if a party who had standing on the issue of sound demonstrates that the revised sound modeling represents a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703. If the Board holds a hearing, the CPG Holder may not commence site preparation or construction of the facility until the Board resolves the issue.

5.705 Post-Construction Sound Monitoring Applicability

(A) Facilities with a plant capacity up to and including 50 kilowatts. Post-construction sound monitoring may be required by the Board for a facility in this category if it is determined that exceedances of the applicable sound-level limit are probable or as part of an investigation into one or more complaints.

(B) Facilities with a plant capacity greater than 50 and up to and including 150 kilowatts. Sound monitoring shall take place in accordance with Section 5.707, below, or pursuant to an alternative monitoring plan adopted in the facility's CPG. In lieu of verifying compliance with the applicable sound-level limit through sound monitoring, a petitioner may propose to locate a wind generation facility in this category such that every sound-producing element of the facility within the turbine footprint will be set back horizontally no less than ten (10) times the turbine's height, as measured from base to the tip of a blade in the upright, vertical position, from the residence of a non-participating landowner.

(C) Facilities with a plant capacity greater than 150 kilowatts. Sound monitoring shall take place during the times specified in section 5.711, in accordance with the requirements of this rule and any requirements of the CPG, which shall specify the minimum number of compliance monitoring locations, the radius from the nearest facility turbine in which monitoring locations may be selected, and the time period of monitoring. The monitoring will be used to verify the accuracy of the pre-construction modeling and facility compliance with CPG conditions and the requirements of this rule. In addition to the requirements of this rule and the CPG, the Board may, at its discretion, require additional monitoring if the results of the initial post-construction sound monitoring or changes to the facility or its operation indicate that exceedances of the sound-level limit are probable.

5.706 Post-Construction Sound Monitoring General Requirements

(A) Monitoring by the State. Post-construction sound monitoring shall be conducted under the direct supervision and control of a State of Vermont agency or agencies designated by the Board. The post-construction sound monitoring shall be paid for by the CPG Holder.

(B) Monitoring locations. A petition for a CPG for a wind generation facility shall include proposed monitoring locations for post-construction monitoring. The proposed locations shall include residential locations that are expected to experience the highest model-predicted equivalent sound levels and are consistent with the requirements of Section 5.707. The proposed locations shall be free from sources of material sound contamination. Any change in monitoring locations must be approved in advance by the Board.

(C) Modification of pre-construction sound modeling. A CPG Holder is required to identify the appropriate inputs and/or assumptions, and modify the pre-construction sound modeling if the post-construction sound monitoring indicates that there is a reasonable likelihood that the expected highest sound levels at any of the monitoring locations would be equal to or greater than 3 dBA above those modeled, or would result in an exceedance of the sound level standard specified in Section 5.703. All parties to the 30 V.S.A. § 248 or § 8010 proceeding in which a CPG was granted who had standing on the issue of sound shall be given an opportunity to review and comment on any change to the sound modeling. The Board may, in its discretion, grant a hearing if a party who had standing on the issue of sound demonstrates that

the revised sound modeling indicates a likelihood of an exceedance of the applicable sound emissions standard specified in Section 5.703.

5.707 Post-Construction Sound Monitoring Methodology

(A) Measurement personnel. Measurements shall be supervised by personnel who are well qualified by training and experience in measurement and evaluation of environmental sound. Certification through the Institute of Noise Control Engineering shall meet the qualification requirements of this section.

(B) Measurement instrumentation. The sound meter or alternative sound measurement system used shall meet all appropriate industry standards and specifications. Each monitoring site shall include installation of an anemometer and other equipment or sensors capable of gathering and recording weather conditions at the microphone (10-meter-level wind speed, wind direction, temperature, humidity, and precipitation) and be equipped with enhanced-performance windscreens capable of significantly reducing or eliminating wind-induced noise contamination over the microphone. The measurement instrumentation shall meet the following specifications unless otherwise approved by the Board:

1. The sound level meter or alternative sound level measurement system shall meet the Type 1 performance requirements of American National Standard Specifications for Sound Level Meters, ANSI S1.4.

2. The integrating sound level meter (or measurement system) shall also meet the Type 1 performance requirements for integrating/averaging in the International Electrotechnical Commission Standard on Integrating-Averaging Sound Level Meters, IEC Publication 61672-1.

3. The filter for determining the existence of tonal sounds shall meet all the requirements of the American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters, ANSI S1.11 and IEC 61260, Type 3-D performance.

4. The acoustical calibrator shall be of a type recommended by the manufacturer of the sound level meter and one that meets the requirements of American National Standard Specification for Acoustical Calibrators, ANSI S1.40.

5. Anemometer(s) for surface (10 meter (m)) (32.8 feet) wind speeds shall have a minimum manufacturer specified accuracy of ±1 mph providing data in 10-second integrations and 10-minute average/maximum values for the evaluation of atmospheric stability.

6. Audio recording devices shall be time stamped (hh:mm:ss), recording the sound signal output from the measurement microphone to be used for identifying events. Audio recording and compliance data collection shall be measured through the same microphone/sound meter and bear the same time

stamp.

(C) Equipment calibration.

1. The sound level meter shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign, and the microphone's response shall be traceable to the National Institute of Standards and Technology.

2. Field calibrations shall be recorded and documented in compliance monitoring reports.

3. The 10-meter anemometer(s) and vane(s) shall have been calibrated to the manufacturer's specification no more than 24 months prior to completion of a measurement campaign.

(D) Compliance measurement location, configuration, and environment.

1. Compliance measurement locations shall be approved by the Board during its review of a facility's request for a CPG and shall be representative of the non-participating residences expected to experience the highest model-predicted facility-only sound levels from routine operation of the wind generation facility, subject to permission from the respective property owner(s). Measurement locations shall reasonably be expected to experience downwind conditions from acoustically significant turbines and shall be free from significant sources of sound contamination, such as high-traffic roadways, industrial or silvicultural activity, etc.

   a. To the greatest extent possible, compliance measurement locations shall be at the center of unobstructed areas that are maintained free of vegetation and other structures or material that is greater than 2 feet in height for a 75-foot radius around the sound and audio monitoring equipment.

   b. To the greatest extent possible, meteorological measurement locations shall be at the center of open flat terrain, inclusive of grass and minimum number of obstacles that are greater than 6 feet in height for a 250-foot radius around the anemometer location. Meteorological measurements shall be taken at the monitoring location at or above the height of the audio/acoustic microphone.

   c. Meteorological measurements of wind speed and direction shall be collected using anemometers at a 10-meter height (32.8 feet) above the ground. Results shall be reported, based on 10-second integration intervals, synchronously with turbine nacelle measurements and measurements made at the sound-meter level at one-minute measurement intervals. The wind speed average and maximum for each one-minute interval shall be reported.

d. The sound microphone shall be positioned at a height of approximately 1.5 meters above the ground, and oriented in accordance with the manufacturer's recommendations.

e. When possible, measurement locations should be at least 50 feet from any sound source. The proposed locations shall be free from sources of material sound contamination. Any non-facility sources of sound shall be noted in the analysis.

5.708 Determination of Background/Ambient Sound Levels

In order to determine the ambient sound levels at a receptor, turbine shutdowns will be required as part of post-construction sound monitoring. A CPG Holder shall conduct turbine shutdowns in accordance with the requirements of its CPG. The CPG shall specify the minimum number and duration of turbine shutdowns during the post-construction sound monitoring. The timing of turbine shutdowns shall be determined by the State of Vermont agency overseeing post-construction sound monitoring in consultation with the project operator. In the event that turbine shutdowns are technically infeasible, background sound levels may be determined using a primary and shielded secondary sound level meter.

5.709 Post-construction Sound Monitoring Specific Measurements

The following data shall be measured and recorded in one-minute increments:

(A) Acoustic parameters:

1. Overall L_{Aeq} (20-20,000 Hz);

2. Unweighted 1/3rd octave spectra (20-20,000 Hz);

3. Narrowband spectra (20-4,000 Hz, 1-Hz resolution, hanning window).

(B) Meteorological data. All meteorological data as specified in Section 5.712 shall be measured and recorded synchronously with the acoustic parameters listed in Section 5.709(A)1, above.

(C) Turbine operational data including power output, rotor rotational speed, and the meteorological data listed in Section 5.707.

5.710 Post-Construction Sound Monitoring Data Analysis

(A) All recorded data shall be categorized as "Turbine On" or "Ambient," or shall be excluded.

1. Turbine On data shall meet the following criteria:

a. All Contributing Turbines for a specific receptor shall be operational. The minimum power output for each Contributing Turbine shall be specified in the project's CPG.

b. The monitoring location receptor shall be within 45° of the direction between a specific measurement location and the acoustic center of the five nearest wind turbines, or fewer if the wind generation facility does not have five wind turbines.

2. Ambient data shall be categorized as such only when all Contributing Turbines are shut down or generating less than 1% of nameplate capacity.

3. Data meeting any of the following criteria shall be excluded from analysis:

   a. Data that cannot be categorized as Turbine On or Ambient;

   b. Periods between 10 minutes prior to and one hour after precipitation at the monitoring location is detected;

   c. Intervals contaminated by transient ambient sound sources, such as passing cars, barking dogs, etc.;

   d. Periods when 10-meter wind speed is greater than 5 meters per second.

(B) Additional frequency-based filtering of the data may be performed if unique conditions at the monitoring location(s) justify such action. In such an instance, the designated individual, agency, or company responsible for sound monitoring data analysis shall notify the Board of the intent to apply additional filtering to an identified set of data and the basis for such action. An opportunity to review and comment on any proposed additional filtering shall be given to all parties to the 30 V.S.A. § 248 or § 8010 proceeding in which a CPG was granted who had standing on the issue of sound prior to the commencement of any additional filtering.

(C) Filtered sound monitoring data shall be analyzed consistent with the following protocols.

1. Overall sound levels shall be derived using the following methodology:

   a. Filtered one-minute L_{Aeq} sound levels shall be separated into Turbine On and Ambient datasets.

   b. Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.

   c. Mean average Turbine On and Ambient sound level shall be computed in each wind bin.

   d. The average Ambient sound level shall be logarithmically subtracted

from the average Turbine On sound level in each wind bin to derive the project-only sound level.

e. Wind bin averages shall not be reported if the difference between the Turbine On average sound level and Ambient sound level in a wind bin is less than 3 dBA.

2. Sound monitoring data analysis shall be based on a minimum of 120 filtered one-minute L_{Aeq} data points. In the event that 20 valid data points in each of the six wind bins are not available, wind bin averages may be reported when there are a minimum of 40 one-minute L_{Aeq} sound levels in at least three wind bins. If sufficient valid data are not obtained after ten (10) weeks of monitoring, the State of Vermont agency designated by the Board shall provide a status update and recommendation for any additional monitoring to the Board.

3. Tonality shall be determined and applied to the overall sound level using the following methodology.

   a. Filtered narrowband spectra shall be separated into Turbine On and Ambient datasets.

   b. Turbine On and Ambient datasets shall be sorted into one-meter-per-second integer wind bins based on the measured average wind speed for each interval at the monitoring location.

   c. The overall average tonal audibility for each wind bin shall be calculated pursuant to the methodology contained in IEC 61400-11 or the latest revision of the same.

   d. If tonal audibility in any wind bin is greater than 2 dB, a penalty to the project-only sound level in that wind bin shall be applied pursuant to ISO 1996-2, Figure C.1 or the latest revision of the same.

5.711 Compliance Data Collection, Measurement, and Retention Procedures

(A) All operational, sound, audio, and meteorological data collected shall be retained by the State of Vermont agency or agencies designated by the Board for the life of the project and subject to inspection upon request.

(B) Monitoring and data collection shall occur at a minimum:

1. Once during the first year of facility operation, including sound power testing pursuant to IEC 61400-11 for each turbine;

2. Once during each successive fifth year thereafter until the facility is decommissioned; and

3. In response to a complaint if ordered by the Board. The Board in its discretion may require additional sound monitoring or sound power testing for a wind generation facility in response to a complaint if the Board determines that a complaint raises a reasonable possibility that a wind generation facility is operating in excess of the sound level limits required by this rule. In making its determination, the Board shall consider:

    a. The details of the complaint;

    b. Any response thereto filed by the operator of the wind generation facility; and

    c. Any response and recommendation by the Department of Public Service after its review of the complaint, the facility operator's response, and any attempts made to resolve the complaint under the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.). As part of any recommendation, the Department may propose a plan for additional sound monitoring or sound power testing of the subject wind generation facility. Any such proposal should incorporate the requirements and standards set forth in subsection (b), below, or set forth an explanation why different requirements and standards are being proposed.

(C) All relevant turbine operational data (SCADA); the date, time, and duration of any NRO or other operational changes that occur during the sound monitoring period; and sound level and meteorological data collected during a compliance measurement period that meets or exceeds the specified wind speed parameters shall be submitted by the State of Vermont agency or agencies designated by the Board to the Board for review and approval. All data shall be submitted to the Board within 60 days of completion of the monitoring period as part of the post-monitoring report. Audio recordings will only be submitted upon request and may be filtered to exclude private conversations and/or submitted under a confidentiality order.

5.712 Reporting of Compliance Measurement Data Compliance reports shall be submitted to the Board within 60 days of the completion of the sound monitoring period. The Board will make the report publicly available. The report shall include a certification that the required monitoring conditions were present and, at a minimum, the following:

(A) A narrative description of the sound from the wind generation facility for the compliance measurement period;

(B) The dates, days of the week, and hours of the day when measurements were made;

(C) The wind direction and speed, temperature, humidity, and sky condition;

(D) Identification of all measurement equipment by make, model, and serial number;

(E) All meteorological, sound, windscreen, and audio instrumentation specifications and calibrations;

(F) All A-weighted equivalent sound levels for each 1-minute measurement interval;

(G) Short-period sound level measurements (50 milliseconds or less);

(H) All L_{A10}, L_{A50}, and L_{A90} percentile levels;

(I) All 1-minute 1/3 octave band unweighted and equivalent continuous sound levels (dB);

(J) Should any sound data collection be observed by a trained attendant, a summary of the attendant's notes and observations;

(K) All concurrent time-stamped, turbine-operational data including the date, time, and duration of any noise-reduction operation or other interruptions in operations, if present; and

(L) All other information determined necessary by the Board.

5.713 Complaint Response Procedures

CPG Holders shall respond to complaints raised by residents located near the wind generation facility in a manner consistent with the complaint response procedure(s) issued by the Vermont Department of Public Service pursuant to Section 5c of Public Act 130 (2016 Vt., Adj. Sess.)

No. 174. An act relating to improving the siting of energy projects.

(S.260)

It is hereby enacted by the General Assembly of the State of Vermont:

* * * Designation * * *

Sec. 1. DESIGNATION OF ACT

This act shall be referred to as the Energy Development Improvement Act.

* * * Integration of Energy and Land Use Planning * * *

Sec. 2. 24 V.S.A. § 4302(c)(7) is amended to read:

(7) To ~~encourage the~~ make efficient use of energy ~~and~~, provide for the development of renewable energy resources, and reduce emissions of greenhouse gases.

(A) General strategies for achieving these goals include increasing the energy efficiency of new and existing buildings; identifying areas suitable for renewable energy generation; encouraging the use and development of renewable or lower emission energy sources for electricity, heat, and transportation; and reducing transportation energy demand and single occupancy vehicle use.

(B) Specific strategies and recommendations for achieving these goals are identified in the State energy plans prepared under 30 V.S.A. §§ 202 and 202b.

Sec. 3. 24 V.S.A. § 4345 is amended to read:

§ 4345. OPTIONAL POWERS AND DUTIES OF REGIONAL PLANNING COMMISSIONS

Any regional planning commission created under this chapter may:

* * *

(6) Undertake studies and make recommendations on land development, urban renewal, transportation, economic, industrial, commercial, and social development, urban beautification and design improvements, historic and scenic preservation, ~~the conservation of energy and the development of renewable energy resources,~~ State capital investment plans, and wetland protection.

* * *

Sec. 4. 24 V.S.A. § 4345a is amended to read:

§ 4345a. DUTIES OF REGIONAL PLANNING COMMISSIONS

A regional planning commission created under this chapter shall:

* * *

(14) With respect to proceedings under 30 V.S.A. § 248:

(A) have the right to appear and participate; and

(B) ~~Appear~~ appear before the Public Service Board to aid ~~the Board~~ in making determinations under ~~30 V.S.A. § 248~~ that statute when requested by the Board.

* * *

generation facility approved under this section shall remain classified as such soils, and the review of any change in use of the site subsequent to the construction of the facility shall treat the soils as if the facility had never been constructed. Each certificate of public good issued by the Board for a ground-mounted solar generation facility shall state the contents of this subsection.

Sec. 11a. RULES; PETITION

(a) On or before November 1, 2016, the Department of Public Service shall file a petition for rulemaking with the Public Service Board containing proposed rules to implement 30 V.S.A. § 248(a)(5) (postconstruction inspection of aesthetic mitigation; decommissioning) as enacted by Sec. 11 of this act.

(b) On or before December 15, 2016, the Public Service Board shall file proposed rules to implement 30 V.S.A. § 248(a)(5) with the Secretary of State under 3 V.S.A. § 838. The Board shall finally adopt such rules on or before August 15, 2017, unless such deadline is extended by the Legislative Committee on Administrative Rules pursuant to 3 V.S.A. § 843(c).

* * * Sound Standards; Wind Generation Facilities * * *

Sec. 12. SOUND STANDARDS; WIND GENERATION

(a) On or before July 1, 2017, the Public Service Board (the Board) shall finally adopt rules under 3 V.S.A. chapter 25 regarding sound from wind generation facilities approved under 30 V.S.A. § 248, unless such deadline is

extended by the Legislative Committee on Administrative Rules pursuant to 3 V.S.A. § 843(c). In developing these rules, the Board shall consider:

(1) standards that apply to all wind generation facilities;

(2) a methodology for determining sound levels and measurement locations for each such facility on a case-by-case basis; or

(3) standards that apply to one or more categories of wind generation facilities, with a methodology for determining sound levels and measurement locations for other such facilities on a case-by-case basis.

(b) On or before 45 days after the effective date of this section, the Board shall adopt temporary rules on sound levels from wind generation facilities using the process under 3 V.S.A. § 844. The rules shall be effective on adoption and shall apply to applications for such facilities under 30 V.S.A. § 248 filed on or after the effective date of this section. Until the Board adopts temporary rules pursuant to this subsection (b), the Board shall not issue a certificate of public good for a wind generation facility for which an application is filed on or after the effective date of this section.

(1) The standard under 3 V.S.A. § 844(a) regarding imminent peril to public health, safety, or welfare shall not apply to the rules to be adopted under this subsection. This subsection employs the process set forth in 3 V.S.A. § 844 solely for the purpose of using an existing rulemaking procedure to adopt temporary rules in a short time frame.

(2) With respect to sound levels from wind generation facilities, these rules shall state:

(A) standards that apply to all such facilities;

(B) a methodology for determining sound levels and measurement locations for each such facility on a case-by-case basis; or

(C) standards that apply to one or more categories of such facilities, with a methodology for determining sound levels and measurement locations for other such facilities on a case-by-case basis.

(3) These rules shall not allow sound levels from a wind generation facility that exceed the lowest maximum decibel levels authorized in any certificate of public good that contains limits on decibel levels issued by the Board for the same category of wind generation facility before the effective date of this section. For the purpose of this subdivision (3), there shall be two categories of wind generation facilities:

(A) facilities with a plant capacity as defined in 30 V.S.A. § 8002 of 500 kilowatts (kW) or less; and

(B) facilities with a plant capacity as defined in 30 V.S.A. § 8002 greater than 500 kW.

(4) Notwithstanding 3 V.S.A. § 844(b), rules adopted pursuant to this subsection (b) shall remain in effect until the earlier of the following:

(A) the effective date of permanent rules finally adopted under subsection (a) of this section; or

(B) the July 1, 2017 deadline stated in subsection (a), as it may be extended pursuant to that subsection.

* * * Preferred Location Pilot; Standard Offer * * *

Sec. 12a. 30 V.S.A. § 8005a is amended to read:

§ 8005a. STANDARD OFFER PROGRAM

* * *

(c) Cumulative capacity. In accordance with this subsection, the Board shall issue standard offers to new standard offer plants until a cumulative plant capacity amount of 127.5 MW is reached.

(1) Pace. Annually commencing April 1, 2013, the Board shall increase the cumulative plant capacity of the standard offer program (the annual increase) until the 127.5-MW cumulative plant capacity of this subsection is reached.

* * *

(D) Pilot project; preferred locations. For one year commencing on January 1, 2017, the Board shall allocate one-sixth of the annual increase to new standard offer plants that will be wholly located in one or more preferred locations other than parking lots or parking lot canopies and, separately, one-sixth of the annual increase of the annual increase to new standard offer plants that will be wholly located over parking lots or on parking lot canopies.

(i) To qualify for these allocations, the plant shall not require the construction of a new substation by the interconnecting retail electricity

The Vermont Statutes Online

Title 30 : Public Service

Chapter 005 : State Policy; Plans; Jurisdiction And Regulatory Authority Of Board And Department

Subchapter 001 : General Powers

(Cite as: 30 V.S.A. § 248)

§ 248. New gas and electric purchases, investments, and facilities; certificate of public good

(a)(1) No company, as defined in section 201 of this title, may:

(A) in any way purchase electric capacity or energy from outside the State:

(i) for a period exceeding five years, that represents more than three percent of its historic peak demand, unless the purchase is from a plant as defined in section 8002 of this title that produces electricity from renewable energy as defined under section 8002; or

(ii) for a period exceeding 10 years, that represents more than 10 percent of its historic peak demand, if the purchase is from a plant as defined in section 8002 of this title that produces electricity from renewable energy as defined under section 8002; or

(B) invest in an electric generation or transmission facility located outside this State unless the Public Service Board first finds that the same will promote the general good of the State and issues a certificate to that effect.

(2) Except for the replacement of existing facilities with equivalent facilities in the usual course of business, and except for electric generation facilities that are operated solely for on-site electricity consumption by the owner of those facilities and for hydroelectric generation facilities subject to licensing jurisdiction under the Federal Power Act, 16 U.S.C. chapter 12, subchapter 1:

(A) no company, as defined in section 201 of this title, and no person, as defined in 10 V.S.A. § 6001(14), may begin site preparation for or construction of an electric generation facility or electric transmission facility within the State which is designed for immediate or eventual operation at any voltage; and

(B) no such company may exercise the right of eminent domain in connection with site preparation for or construction of any such transmission or generation facility, unless the Public Service Board first finds that the same will promote the general good of the State and issues a certificate to that effect.

(3) No company, as defined in section 201 of this title, and no person, as defined in 10 V.S.A. § 6001(14), may in any way begin site preparation for or commence construction of any natural gas facility, except for the replacement of existing facilities with equivalent facilities in the usual course of business, unless the Public Service Board first finds that the same will promote the general good of the State and issues a certificate to that effect pursuant to this section.

(A) For the purposes of this section, the term "natural gas facility" shall mean any natural gas transmission line, storage facility, manufactured-gas facility, or other structure incident to any of the above. For purposes of this section, a "natural gas transmission line" shall include any feeder main or any pipeline facility constructed to deliver natural gas in Vermont directly from a natural gas pipeline facility that has been certified pursuant to the Natural Gas Act, 15 U.S.C. § 717 et seq.

(B) For the purposes of this section, the term "company" shall not include a "natural gas company" (including a "person which will be a natural gas company upon completion of any proposed construction or extension of facilities"), within the meaning of the Natural Gas Act, 15 U.S.C. § 717 et seq.; provided however, that the term "company" shall include any "natural gas company" to the extent it proposes to construct in Vermont a natural gas facility that is not solely subject to federal jurisdiction under the Natural Gas Act.

(C) The Public Service Board shall have the authority to, and may in its discretion, conduct a proceeding, as set forth in subsection (h) of this section, with respect to a natural gas facility proposed to be constructed in Vermont by a "natural gas company" for the purpose of developing an opinion in connection with federal certification or other federal approval proceedings.

(4)(A) With respect to a facility located in the State, the Public Service Board shall hold a nontechnical public hearing on each petition for such finding and certificate in at least one county in which any portion of the construction of the facility is proposed to be located.

(B) The Public Service Board shall hold technical hearings at locations which it selects.

(C) At the time of filing its application with the Board, copies shall be given by the petitioner to the Attorney General and the Department of Public Service, and, with respect to facilities within the State, the Department of Health, Agency of Natural Resources, Historic Preservation Division, Agency of Transportation, Agency of Agriculture, Food and Markets, and to the chair or director of the municipal and regional planning commissions and the municipal legislative body for each town and city in which the proposed facility will be located.

(D) Notice of the public hearing shall be published and maintained on the Board's website for at least 12 days before the day appointed for the hearing. Notice of the public hearing shall be published once in a newspaper of general circulation in the county or counties in which the proposed facility will be located, and the notice shall include an Internet address where more information regarding the proposed facility may be viewed.

(E) The Agency of Natural Resources shall appear as a party in any proceedings held under this subsection, shall provide evidence and recommendations concerning any findings to be made under subdivision (b)(5) of this section, and may provide evidence and recommendations concerning any other matters to be determined by the Board in such a proceeding.

(F) The following shall apply to the participation of the Agency of Agriculture, Food and Markets in proceedings held under this subsection:

(i) In any proceeding regarding an electric generation facility that will have a capacity greater than 500 kilowatts and will be sited on a tract containing primary agricultural soils as defined in 10 V.S.A. § 6001, the Agency shall appear as a party and provide evidence and recommendations concerning any findings to be made under subdivision (b)(5) of this section on those soils, and may provide evidence and recommendations concerning any other matters to be determined by the Board in such a proceeding.

(ii) In a proceeding other than one described in subdivision (i) of this subdivision (4)(F), the Agency shall have the right to appear and participate.

(G) The regional planning commission for the region in which the facility is located shall have the right to appear as a party in any proceedings held under this subsection. The regional planning commission of an adjacent region shall have the same right if the distance of the facility's nearest component to the boundary of that planning commission is 500 feet or 10 times the height of the facility's tallest component, whichever is greater.

(H) The legislative body and the planning commission for the municipality in which a facility is located shall have the right to appear as a party in any proceedings held under this subsection. The legislative body and planning commission of an adjacent municipality shall have the same right if the distance of the facility's nearest component to the boundary of that adjacent municipality is 500 feet or 10 times the height of the facility's tallest component, whichever is greater.

(I) When a person has the right to appear as a party in a proceeding before the Board under this chapter, the person may exercise this right by filing a letter with the Board stating that the person appears through the person's duly authorized representative, signed by that representative.

(J) This subdivision (J) applies to an application for an electric generation facility with a capacity that is greater than 50 kilowatts, unless the facility is located on a new or existing structure the primary purpose of which is not the generation of electricity. In addition to any other information required by the Board, the application for such a facility shall include information that delineates:

(i) the full limits of physical disturbance due to the construction and operation of the facility and related infrastructure, including areas disturbed due to the creation or modification of access roads and utility lines and the clearing or management of vegetation;

(ii) the presence and total acreage of primary agricultural soils as defined in 10 V.S.A. § 6001 on each tract to be physically disturbed in connection with the construction and operation of the facility, the amount of those soils to be disturbed, and any other proposed impacts to those soils;

(iii) all visible infrastructure associated with the facility; and

(iv) all impacts of the facility's construction and operation under subdivision (b)(5) of this section, including impacts due to the creation or modification of access roads and utility lines and the clearing or management of vegetation.

(5) The Board shall adopt rules regarding standard conditions on postconstruction inspection and maintenance of aesthetic mitigation and on decommissioning to be included in certificates of public good for in-state facilities approved under this section. The purpose of these standard conditions shall be to ensure that all required aesthetic mitigation is performed and maintained and that facilities are removed once they are no longer in service.

(6) In any certificate of public good issued under this section for an in-state plant as defined in section 8002 of this title that generates electricity from wind, the Board shall require the plant to install radar-controlled obstruction lights on all wind turbines for which the Federal Aviation Administration (FAA) requires obstruction lights, if the plant includes four or more wind turbines and the FAA allows the use of radar-controlled lighting technology.

(A) Nothing in this subdivision shall allow the Board to approve obstruction lights that do not meet FAA standards.

(B) The purpose of this subdivision (6) is to reduce the visual impact of wind turbine obstruction lights on the environment and nearby properties. The General Assembly finds that wind turbine obstruction lights that remain illuminated through the night create light pollution. Radar-controlled obstruction lights are only illuminated when aircraft are detected in the area, and therefore the use of these lights will reduce the negative environmental impacts of obstruction lights.

(7) When a certificate of public good under this section or amendment to such a certificate is issued for an in-state electric generation facility with a capacity that is greater than 15 kilowatts, the certificate holder within 45 days shall record a notice of the certificate or amended certificate, on a form prescribed by the Board, in the land records of each municipality in which a facility subject to the certificate is located and shall submit proof of this recording to the Board. The recording under this subsection shall be indexed as though the certificate holder were the grantor of a deed. The prescribed form shall not exceed one page and shall require identification of the land on which the facility is to be located by reference to the conveyance to the current landowner, the number of the certificate, and the name of each person to which the certificate was issued, and shall include information on how to contact the Board to view the certificate and supporting documents.

(b) Before the Public Service Board issues a certificate of public good as required under subsection (a) of this section, it shall find that the purchase, investment, or construction:

(1) With respect to an in-state facility, will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. However:

(A) With respect to a natural gas transmission line subject to Board review, the line shall be in conformance with any applicable provisions concerning such lines contained in the duly adopted regional plan; and, in addition, upon application of any party, the Board shall condition any certificate of public good for a natural gas transmission line issued under this section so as to prohibit service connections that would not be in conformance with the adopted municipal plan in any municipality in which the line is located.

(B) With respect to a ground-mounted solar electric generation facility, the facility shall comply with the screening requirements of a municipal bylaw adopted under 24 V.S.A. § 4414(15) or a municipal ordinance adopted under 24 V.S.A. § 2291(28), and the recommendation of a municipality applying such a bylaw or ordinance, unless the Board finds that requiring such compliance would prohibit or have the effect of prohibiting the installation of such a facility or have the effect of interfering with the facility's intended functional use.

(C) With respect to an in-state electric generation facility, the Board shall give substantial deference to the land conservation measures and specific policies contained in a duly adopted regional and municipal plan that has received an affirmative determination of energy compliance under 24 V.S.A. § 4352. In this subdivision (C), "substantial deference" means that a land conservation measure or

specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy. The term shall not include consideration of whether the determination of energy compliance should or should not have been affirmative under 24 V.S.A. § 4352.

(2) Is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures, including those developed pursuant to the provisions of subsection 209(d), section 218c, and subsection 218(b) of this title. In determining whether this criterion is met, the Board shall assess the environmental and economic costs of the purchase, investment, or construction in the manner set out under subdivision 218c(a)(1) (least-cost integrated plan) of this title and, as to a generation facility, shall consider whether the facility will avoid, reduce, or defer transmission or distribution system investments.

(3) Will not adversely affect system stability and reliability.

(4) Will result in an economic benefit to the State and its residents.

(5) With respect to an in-state facility, will not have an undue adverse effect on aesthetics, historic sites, air and water purity, the natural environment, the use of natural resources, and the public health and safety, with due consideration having been given to the criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K), impacts to primary agricultural soils as defined in 10 V.S.A. § 6001, and greenhouse gas impacts.

(6) With respect to purchases, investments, or construction by a company, is consistent with the principles for resource selection expressed in that company's approved least-cost integrated plan.

(7) Except as to a natural gas facility that is not part of or incidental to an electric generating facility, is in compliance with the electric energy plan approved by the Department under section 202 of this title, or that there exists good cause to permit the proposed action.

(8) Does not involve a facility affecting or located on any segment of the waters of the State that has been designated as outstanding resource waters by the Secretary of Natural Resources, except that with respect to a natural gas or electric transmission facility, the facility does not have an undue adverse effect on those outstanding resource waters.

(9) With respect to a waste to energy facility:

(A) is included in a solid waste management plan adopted pursuant to 24 V.S.A. § 2202a, which is consistent with the State Solid Waste Management Plan; and

(B) is included in a solid waste management plan adopted pursuant to 24 V.S.A. § 2202a for the municipality and solid waste district from which 1,000 tons or more per year of the waste is to originate, if that municipality or district owns an operating facility that already beneficially uses a portion of the waste.

(10) Except as to a natural gas facility that is not part of or incidental to an electric generating facility, can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers.

(11) With respect to an in-state generation facility that produces electric energy using woody biomass, will:

(A) comply with the applicable air pollution control requirements under the federal Clean Air Act, 42 U.S.C. § 7401 et seq.;

(B) achieve the highest design system efficiency that is commercially available, feasible, and cost-effective for the type and design of the proposed facility; and

(C) comply with harvesting procedures and procurement standards that ensure long-term forest health and sustainability. These procedures and standards at a minimum shall be consistent with the guidelines and standards developed pursuant to 10 V.S.A. § 2750 (harvesting guidelines and procurement standards) when adopted under that statute.

(c)(1) Except as otherwise provided in subdivision (j)(3) of this section, in the case of a municipal plant or department formed under local charter or chapter 79 of this title or a cooperative formed under chapter 81 of this title, any proposed investment, construction, or contract which is subject to this section shall be approved by a majority of the voters of a municipality or the members of a cooperative voting upon the question at a duly warned annual or special meeting to be held for that purpose. However, in the case of a cooperative formed under chapter 81 of this title, an investment in or construction of an in-state electric transmission facility shall not be subject to the requirements of this subsection if the investment or construction is solely for reliability purposes and does not include new construction or upgrades to serve a new generation facility.

(2) The municipal department or cooperative shall provide to the voters or members, as the case may be, written assessment of the risks and benefits of the proposed investment, construction, or contract which were identified by the Public

Service Board in the certificate issued under this section. The municipal department or cooperative also may provide to the voters an assessment of any other risks and benefits.

(d) Nothing in this section shall be construed to prohibit a company from executing a letter of intent or entering into a contract before the issuance of a certificate of public good under this section, provided that the company's obligations under that letter of intent or contract are made subject to compliance with the requirements of this section.

(e)(1) Before a certificate of public good is issued for the construction of a nuclear energy generating plant within the State, the Public Service Board shall obtain the approval of the General Assembly and the Assembly's determination that the construction of the proposed facility will promote the general welfare. The Public Service Board shall advise the General Assembly of any petition submitted under this section for the construction of a nuclear energy generating plant within this State, by written notice delivered to the Speaker of the House of Representatives and to the President of the Senate. The Department of Public Service shall submit recommendations relating to the proposed plant, and shall make available to the General Assembly all relevant material. The requirements of this subsection shall be in addition to the findings set forth in subsection (b) of this section.

(2) No nuclear energy generating plant within this State may be operated beyond the date permitted in any certificate of public good granted pursuant to this title, including any certificate in force as of January 1, 2006, unless the General Assembly approves and determines that the operation will promote the general welfare, and until the Public Service Board issues a certificate of public good under this section. If the General Assembly has not acted under this subsection by July 1, 2008, the Board may commence proceedings under this section and under 10 V.S.A. chapter 157, relating to the storage of radioactive material, but may not issue a final order or certificate of public good until the General Assembly determines that operation will promote the general welfare and grants approval for that operation.

(f) However, plans for the construction of such a facility within the State must be submitted by the petitioner to the municipal and regional planning commissions no less than 45 days prior to application for a certificate of public good under this section, unless the municipal and regional planning commissions shall waive such requirement.

(1) Such municipal or regional planning commission may hold a public hearing on the proposed plans. Such commissions shall make recommendations, if any, to the Public Service Board and to the petitioner at least seven days prior to filing of the petition with the Public Service Board.

(2) The petitioner's application shall address the substantive written comments related to the criteria of subsection (b) of this section received by the petitioner within 45 days of the submittal made under this subsection and the substantive oral comments related to those criteria made at a public hearing under subdivision (1) of this subsection.

(g) Notwithstanding the 45 days' notice required by subsection (f) of this section, plans involving the relocation of an existing transmission line within the State must be submitted to the municipal and regional planning commissions no less than 21 days prior to application for a certificate of public good under this section.

(h) The position of the State of Vermont in federal certification or other approval proceedings for natural gas facilities shall be developed in accordance with this subsection.

(1) A natural gas facility requiring federal approval shall apply to the Public Service Board for an opinion under this section (on or before the date on which the facility applies for such federal approval in the case of a facility that has not applied for federal approval before January 16, 1988). Any opinion issued under this subsection shall be developed based upon the criteria established in subsection (b) of this section.

(2) If the Board conducts proceedings under this subsection, the Department shall give due consideration to the Board's opinion as to facilities of a natural gas company, and that opinion shall guide the position taken before federal agencies by the State of Vermont, acting through the Department of Public Service under section 215 of this title.

(3) If the Board conducts proceedings under this subsection, it may consolidate them, solely for purposes of creating a common record, with any related proceedings conducted under subdivision (a)(3) of this section.

(i)(1) No company, as defined in sections 201 and 203 of this title, without approval by the Board, after giving notice of such investment, or filing a copy of that contract, with the Board and the Department at least 30 days prior to the proposed effective date of that contract or investment:

(A) may invest in a gas-production facility located outside this State; or

(B) may execute a contract for the purchase of gas from outside the State, for resale to firm-tariff customers, that:

(i) is for a period exceeding five years; or

(ii) represents more than 10 percent of that company's peak demand for resale to firm-tariff customers.

(2) The Department and the Board shall consider within 30 days whether to

investigate the proposed investment or contract.

(3) The Board, upon its own motion, or upon the recommendation of the Department, may determine to initiate an investigation. If the Board does not initiate an investigation within such 30-day period, the contract or investment shall be deemed to be approved. If the Board determines to initiate an investigation, it shall give notice of that decision to the company proposing the investment or contract, the Department, and such other persons as the Board determines are appropriate. The Board shall conclude its investigation within 120 days of issuance of its notice of investigation, or within such shorter period as it deems appropriate. If the Board fails to issue a decision within that 120-day period, the contract or investment shall be deemed to be approved. The Board may hold informal, public, or technical hearings on the proposed investment or contract.

(4) Nothing in this subsection shall prohibit a company from negotiating or adjusting periodically the price of other terms of supply through a supplement to such a contract, provided that the supplement falls within the terms specified in such a contract, as approved. The Board's authority to investigate such adjustments under other authorities of this title shall not be impaired. Such a company shall file with the Department and the Board a copy of any such supplement to the contract or other documentation that states any terms that have been renegotiated or adjusted by the company at least 30 days prior to the effective date of the renegotiated or adjusted price or other terms.

(5) Nothing in this subsection shall be construed to prohibit a gas company from executing a development contract, a contract for design and engineering, a contract to seek regulatory approvals for a gas-production facility, or a letter of intent for such purchase of gas that makes the company's obligations under that letter of intent subject to the requirements of this subsection, prior to the filing with the Board and Department of such notice or proposed contract or pending any investigation under this subsection.

(j)(1) The Board may, subject to such conditions as it may otherwise lawfully impose, issue a certificate of public good in accordance with the provisions of this subsection and without the notice and hearings otherwise required by this chapter if the Board finds that:

(A) approval is sought for construction of facilities described in subdivision (a)(2) or (3) of this section;

(B) such facilities will be of limited size and scope;

(C) the petition does not raise a significant issue with respect to the substantive criteria of this section; and

(D) the public interest is satisfied by the procedures authorized by this

subsection.

(2) Any party seeking to proceed under the procedures authorized by this subsection shall file a proposed certificate of public good and proposed findings of fact with its petition. The Board shall give written notice of the proposed certificate to the parties specified in subdivision (a)(4)(C) of this section, to any public interest organization that has in writing requested notice of applications to proceed under this subsection and to any other person found by the Board to have a substantial interest in the matter. Such notice shall be published on the Board's website and shall request comment within the Board's website and shall request comment within 28 days of the initial publication on the question of whether the petition raises a significant issue with respect to the substantive criteria of this section. If the Board finds that the petition raises a significant issue with respect to the substantive criteria of this section, the Board shall hear evidence on any such issue.

(3) The construction of facilities authorized by a certificate issued under this subsection shall not require the approval of voters of a municipality or the members of a cooperative, as would otherwise be required under subsection (c) of this section.

(k)(1) Notwithstanding any other provisions of this section, the Board may waive, for a specified and limited time, the prohibitions contained in this section upon site preparation for or construction of an electric transmission facility or a generation facility necessary to ensure the stability or reliability of the electric system or a natural gas facility, pending full review under this section.

(2) A person seeking a waiver under this subsection shall file a petition with the Board and shall provide copies to the Department of Public Service and the Agency of Natural Resources. Upon receiving the petition, the Board shall conduct an expedited preliminary hearing, upon such notice to the governmental bodies listed in subdivision (a)(4)(C) of this section as the Board may require.

(3) An order granting a waiver may include terms, conditions, and safeguards, including the posting of a bond or other security, as the Board deems proper, considering the scope and duration of the requested waiver.

(4) A waiver shall be granted only upon a showing that:

(A) good cause exists because an emergency situation has occurred;

(B) the waiver is necessary to provide adequate and efficient service or to preserve the property of the public service company devoted to public use;

(C) measures will be taken, as the Board deems appropriate, to minimize significant adverse impacts under the criteria specified in subdivisions (b)(5) and (8) of this section; and

(D) taking into account any terms, conditions, and safeguards that the Board may require, the waiver will promote the general good of the State.

(5) Upon the expiration of a waiver, if a certificate of public good has not been issued under this section, the Board shall require the removal, relocation or alteration of the facilities subject to the waiver, as it finds will best promote the general good of the State.

(l) Notwithstanding other provisions of this section, and without limiting any existing authority of the Governor, and pursuant to 20 V.S.A. § 9(10) and (11), when the Governor has proclaimed a state of emergency pursuant to 20 V.S.A. § 9, the Governor, in consultation with the Chair of the Public Service Board and the Commissioner of Public Service or their designees, may waive the prohibitions contained in this section upon site preparation for or construction of an electric transmission facility or a generation facility necessary to ensure the stability or reliability of the electric system or a natural gas facility. Waivers issued under this subsection shall be subject to such conditions as are required by the Governor, and shall be valid for the duration of the declared emergency plus 180 days, or such lesser overall term as determined by the Governor. Upon the expiration of a waiver under this subsection, if a certificate of public good has not been issued under this section, the Board shall require the removal, relocation, or alteration of the facilities, subject to the waiver, as the Board finds will best promote the general good of the State.

(m) In any matter with respect to which the Board considers the operation of a nuclear energy generating plant beyond the date permitted in any certificate of public good granted under this title, including any certificate in effect as of January 1, 2006, the Board shall evaluate the application under current assumptions and analyses and not an extension of the cost benefit assumptions and analyses forming the basis of the previous certificate of public good for the operation of the facility.

(n)(1) No company as defined in section 201 of this title and no person as defined in 10 V.S.A. § 6001(14) may place or allow the placement of wireless communications facilities on an electric transmission or generation facility located in this State, including a net metering system, without receiving a certificate of public good from the Public Service Board pursuant to this subsection. The Public Service Board may issue a certificate of public good for the placement of wireless communications facilities on electric transmission and generation facilities if such placement is in compliance with the criteria of this section and Board rules or orders implementing this section. In developing such rules and orders, the Board:

(A) may waive the requirements of this section that are not applicable to wireless telecommunication facilities, including criteria that are generally applicable to public service companies as defined in this title;

(B) may modify notice and hearing requirements of this title as it deems appropriate;

(C) shall seek to simplify the application and review process as appropriate; and

(D) shall be aimed at furthering the State's interest in ubiquitous mobile telecommunications and broadband service in the State.

(2) Notwithstanding subdivision (1)(B) of this subsection, if the Board finds that a petition filed pursuant to this subsection does not raise a significant issue with respect to the criteria enumerated in subdivisions (b)(1), (3), (4), (5), and (8) of this section, the Board shall issue a certificate of public good without a hearing. If the Board fails to issue a final decision or identify a significant issue with regard to a completed petition made under this section within 60 days of its filing with the Clerk of the Board and service to the Director of Public Advocacy for the Department of Public Service, the petition is deemed approved by operation of law. The rules required by this subsection shall be adopted within six months of the effective date of this section, and rules under this section may be adopted on an emergency basis to comply with the dates required by this section. As used in this subsection, "wireless communication facilities" include antennae, related equipment, and equipment shelter, but do not include equipment used by utilities exclusively for intra- and inter-utility communications.

(o) The Board shall not reject as incomplete a petition under this section for a wind generation facility on the grounds that the petition does not specify the exact make or dimensions of the turbines and rotors to be installed at the facility as long as the petition provides the maximum horizontal and vertical dimensions of those turbines and rotors and the maximum decibel level that the turbines and rotors will produce as measured at the nearest residential structure over a 12-hour period commencing at 7:00 p.m.

(p) An in-state generation facility receiving a certificate under this section that produces electric energy using woody biomass shall annually disclose to the Board the amount, type, and source of wood acquired to generate energy.

(q)(1) A certificate under this section shall be required for a plant using methane derived from an agricultural operation as follows:

(A) With respect to a plant that constitutes farming pursuant to 10 V.S.A. § 6001(22)(F), only for the equipment used to generate electricity from biogas, the equipment used to refine biogas into natural gas, the structures housing such equipment used to generate electricity or refine biogas, and the interconnection to electric and natural gas distribution and transmission systems. The certificate shall not be required for the methane digester, the digester influents and non-gas effluents, the buildings and equipment used to handle such influents and non-gas

effluents, or the on-farm use of heat and exhaust produced by the generation of electricity, and these components shall not be subject to jurisdiction under this section.

(B) With respect to a plant that does not constitute farming pursuant to 10 V.S.A. § 6001(22)(F) but which receives feedstock from off-site farms, for all on-site components of the plant, for the transportation of feedstock to the plant from off-site contributing farms, and the transportation of effluent or digestate back to those farms. The certificate shall not regulate any farming activities conducted on the contributing farms that provide feedstock to a plant or use of effluent or digestate returned to the contributing farms from the plant.

(2) Notwithstanding 1 V.S.A. § 214 and Board Rule 5.408, if the Board issued a certificate to a plant using methane derived from an agricultural operation prior to July 1, 2013, such certificate shall require an amendment only when there is a substantial change, pursuant to Board Rule 5.408, to the equipment used to generate electricity from biogas, the equipment used to refine biogas into natural gas, the structures housing such equipment used to generate electricity or refine biogas, or the interconnection to electric and natural gas distribution and transmission systems. The Board's jurisdiction in any future proceedings concerning such a certificate shall be limited pursuant to subdivision (1) of this subsection.

(3) This subsection shall not affect the determination, under section 8005a of this title, of the price for a standard offer to a plant using methane derived from an agricultural operation.

(4) As used in this section, "biogas" means a gas resulting from the action of microorganisms on organic material such as manure or food processing waste.

(r) The Board may provide that, in any proceeding under subdivision (a)(2)(A) of this section for the construction of a renewable energy plant, a demonstration of compliance with subdivision (b)(2) of this section, relating to establishing need for the plant, shall not be required if all or part of the electricity to be generated by the plant is under contract to one or more Vermont electric distribution companies and if no part of the plant is financed directly or indirectly through investments, other than power contracts, backed by Vermont electricity ratepayers. In this subsection, "plant" and "renewable energy" shall be as defined in section 8002 of this title.

(s) This subsection sets minimum setback requirements that shall apply to in-state ground-mounted solar electric generation facilities approved under this section.

(1) The minimum setbacks shall be:

(A) from a State or municipal highway, measured from the edge of the

traveled way:

(i) 100 feet for a facility with a plant capacity exceeding 150 kW; and

(ii) 40 feet for a facility with a plant capacity less than or equal to 150 kW but greater than 15 kW.

(B) From each property boundary that is not a State or municipal highway:

(i) 50 feet for a facility with a plant capacity exceeding 150 kW; and

(ii) 25 feet for a facility with a plant capacity less than or equal to 150 kW but greater than 15 kW.

(2) This subsection does not require a setback for a facility with a plant capacity equal to or less than 15 kW.

(3) On review of an application, the Board may:

(A) require a larger setback than this subsection requires; or

(B) approve an agreement to a smaller setback among the applicant, the municipal legislative body, and each owner of property adjoining the smaller setback.

(4) In this subsection:

(A) "kW" and "plant capacity" shall have the same meaning as in section 8002 of this title.

(B) "Setback" means the shortest distance between the nearest portion of a solar panel or support structure for a solar panel, at its point of attachment to the ground, and a property boundary or the edge of a highway's traveled way.

(t) Notwithstanding any contrary provision of the law, primary agricultural soils as defined in 10 V.S.A. § 6001 located on the site of a solar electric generation facility approved under this section shall remain classified as such soils, and the review of any change in use of the site subsequent to the construction of the facility shall treat the soils as if the facility had never been constructed. Each certificate of public good issued by the Board for a ground-mounted solar generation facility shall state the contents of this subsection. (Added 1969, No. 69, § 1, eff. April 18, 1969; amended 1969, No. 207 (Adj. Sess.), § 12, eff. March 24, 1970; 1971, No. 208 (Adj. Sess.), eff. March 31, 1972; 1975, No. 23; 1977, No. 11, §§ 1, 2; 1979, No. 204 (Adj. Sess.), § 31, eff. Feb. 1, 1981; 1981, No. 111 (Adj. Sess.); 1983, No. 45; 1985, No. 48, § 1; 1987, No. 65, § 1, eff. May 28, 1987; 1987, No. 67, § 14; 1987, No. 273 (Adj. Sess.) § 1, eff. June 21, 1988; 1989, No. 256 (Adj. Sess.), § 10(a), eff. Jan. 1, 1991; 1991, No. 99, §§ 3, 4; 1991, No. 259 (Adj. Sess.), §§ 6, 7; 1993, No. 21, § 10, eff. May 12, 1993; 1993, No. 159 (Adj. Sess.), § 1a, eff. May 19, 1994; 2003, No. 42, § 2, eff. May 27, 2003; 2003, No. 82 (Adj. Sess.), §§ 2, 3; 2005, No. 160 (Adj.

Sess.), §§ 2, 3; 2007, No. 79, § 16, eff. June 9, 2007; 2009, No. 6, §§ 1, 2, 3, eff. April 30, 2009; 2009, No. 45, § 7, eff. May 27, 2009; 2009, No. 146 (Adj. Sess.), § F30; 2011, No. 47, § 5; 2011, No. 62, § 26; 2011, No. 138 (Adj. Sess.), § 27, eff. May 14, 2012; 2011, No. 170 (Adj. Sess.), § 12, eff. May 18, 2012; 2013, No. 24, § 4, eff. May 13, 2013; 2013, No. 88, § 1; 2015, No. 23, § 151; 2015, No. 40, § 31; 2015, No. 51, § F.9, eff. June 3, 2015; 2015, No. 56, §§ 19, 20; 2015, No. 56, §§ 26a, 26b, 26c, eff. June 11, 2015; 2015, No. 174 (Adj. Sess.), § 11, eff. June 13, 2016.)

The Vermont Statutes Online

Title 30 : Public Service

Chapter 001 : Appointment, General Powers, And Duties

(Cite as: 30 V.S.A. § 3)

§ 3. Public Service Board

(a) The Public Service Board shall consist of a Chair and two members. The Chair and each member shall not be required to be admitted to the practice of law in this State.

(b) The Chair shall be nominated, appointed, and confirmed in the manner of a Superior judge.

(c) Members of the Board other than the Chair shall be appointed in accordance with this subsection. Whenever a vacancy occurs, public announcement of the vacancy shall be made. The Governor shall submit at least five names of potential nominees to the Judicial Nominating Board for review. The Judicial Nominating Board shall review the candidates in respect to judicial criteria and standards only and shall recommend to the Governor those candidates the Board considers qualified. The Governor shall make the appointment from the list of qualified candidates. The appointment shall be subject to the consent of the Senate.

(d) The term of each member shall be six years. Any appointment to fill a vacancy shall be for the unexpired portion of the term vacated. A member wishing to succeed himself or herself in office may seek reappointment under the terms of this section.

(e) Notwithstanding 3 V.S.A. § 2004, or any other provision of law, members of the Board may be removed only for cause. When a Board member who hears all or a substantial part of a case retires from office before such case is completed, he or she shall remain a member of the Board for the purpose of concluding and deciding such case, and signing the findings, orders, decrees, and judgments therein. A retiring Chair shall also remain a member for the purpose of certifying questions of law if appeal is taken. For such service, he or she shall receive a reasonable compensation to be fixed by the remaining members of the Board and necessary expenses while on official business.

(f) A case shall be deemed completed when the Board enters a final order therein even though such order is appealed to the Supreme Court and the case remanded by that court to the Board. Upon remand the Board then in office may in its discretion consider relevant evidence including any part of the transcript of testimony in the proceedings prior to appeal.

(g) The Chair shall have general charge of the offices and employees of the Board. (Amended 1959, No. 329 (Adj. Sess.), § 39(b), (c), eff. March 1, 1961; 1979, No. 204 (Adj. Sess.), § 3, eff. Feb. 1, 1981; 1985, No. 108 (Adj. Sess.), § 3, eff. March 25, 1986; 1993, No. 21, § 1, eff. May 12, 1993.)

VERMONT

Proposed Rules Postings
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Search Rules

Deadline For Public Comment

Deadline: May 11, 2017

Please submit comments to the agency or primary contact person listed below, before the deadline.

Rule Details

Rule Number:	17P010
Title:	Rule on Sound Levels from Wind Generation Facilities.
Type:	Standard
Status:	Proposed
Agency:	Public Service Board
Legal Authority:	Section 12(a) of Act 174 of 2016; 30 V.S.A. § 248; 30 V.S.A. § 3
Summary:	The rule establishes a sound level limit at nearby non-participating residences that wind generation facilities must meet. In addition, the rule defines standards for how to model sound impacts during the permitting process and compliance methodologies to monitor and analyze sound level from a wind generation facility after construction.
Persons Affected:	Vermont wind generation facility developers; Prospective neighbors of wind generation projects; Prospective host towns of wind generation projects; Vermont regional planning commissions; Vermont Department of Public Service; Vermont Department of Health; and Vermont Agency of Natural Resources.
Economic Impact:	The rule will impose costs on developers seeking to develop a wind generation facility, who will be required to provide a model of the sound impacts of a proposed facility and will be required to pay for compliance testing following construction. In addition, the rule may have indirect impacts due to potential limitations on the number of sites where it may be possible to host a facility under the rule.
Posting date:	Mar 22,2017

Hearing Information

Information for Hearing # 1

Hearing date:	05-01-2017 7:00 PM ADD TO YOUR CALENDAR
Location:	Bennington Fire Facility
Address:	130 River Street
City:	Bennington
State:	VT
Zip:	05201

Hearing Notes:

Information for Hearing # 2

Hearing date:	05-02-2017 7:00 PM ADD TO YOUR CALENDAR
Location:	Lowell Grade School
Address:	52 Gelo Park Road
City:	Lowell
State:	VT
Zip:	05847
Hearing Notes:	

Information for Hearing # 3

Hearing date:	05-04-2017 7:00 PM ADD TO YOUR CALENDAR
Location:	Montpelier High School
Address:	5 High School Drive
City:	Montpelier
State:	VT
Zip:	05602
Hearing Notes:	

Information for Hearing # 4

Hearing date:	05-04-2017 7:00 PM ADD TO YOUR CALENDAR
Location:	Public Service Board
Address:	112 State Street
City:	Montpelier
State:	VT
Zip:	05602
Hearing Notes:	

Contact Information

Information for Contact # 1

Level:	Primary
Name:	Thomas Knauer
Agency:	Public Service Board
Address:	112 State Street, 4th Floor
City:	Montpelier
State:	VT
Zip:	05602
Telephone:	802-828-2358
Fax:	
Email:	thomas.knauer@vermont.gov SEND A COMMENT
Website Address:	http://psb.vermont.gov/aout-us/stattues-and-rules/proposed-rule-sound-wind-generation-facilities VIEW WEBSITE

Information for Contact # 2

Level:	Secondary
Name:	Kevin Fink
Agency:	Public Service Board
Address:	112 State Street, 4th Floor
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Email:	kevin.fink@vermont.gov SEND A COMMENT

Keyword Information

Keywords:

Wind
Electric Generation
Noise
Sound

17 P007

OFFICE OF THE SECRETARY OF STATE

VERMONT STATE ARCHIVES & RECORDS ADMINISTRATION

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	The Islander (islander@vermontislander.com)	Tel: 802-372-5600 FAX: 802-372-3025
	Vermont Lawyer (hunter.press.vermont@gmail.com)	Attn: Will Hunter

FROM: Louise Corliss, APA Clerk **Date of Fax:** March 21, 2017

RE: The "Proposed State Rules " ad copy to run on **March 30, 2017**

PAGES INCLUDING THIS COVER MEMO: **2**

NOTE **8-pt font in body. 12-pt font max. for headings - single space body. Please include dashed lines where they appear in ad copy. Otherwise minimize the use of white space. Exceptions require written approval.**

If you have questions, or if the printing schedule of your paper is disrupted by holiday etc. please contact Louise Corliss at 802-828-2863, or E-Mail louise.corliss@sec.state.vt.us, Thanks.

PROPOSED STATE RULES

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By law, public notice of proposed rules must be given by publication in newspapers of record. The purpose of these notices is to give the public a chance to respond to the proposals. The public notices for administrative rules are now also available online at https://secure.vermont.gov/SOS/rules/ . The law requires an agency to hold a public hearing on a proposed rule, if requested to do so in writing by 25 persons or an association having at least 25 members.

To make special arrangements for individuals with disabilities or special needs please call or write the contact person listed below as soon as possible.

To obtain further information concerning any scheduled hearing(s), obtain copies of proposed rule(s) or submit comments regarding proposed rule(s), please call or write the contact person listed below. You may also submit comments in writing to the Legislative Committee on Administrative Rules, State House, Montpelier, Vermont 05602 (802-828-2231).

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10 V.S.A. Appendix Chapter 2, § 107. Handheld Spear, Speargun, Crossbow, and Bow and Arrow, § 122. Fish Management Regulation, § 123. Commercial Angling Rule, and § 109. Bow and Arrow, shooting carp.

Vermont Proposed Rule: 17P009

AGENCY: Vermont Fish and Wildlife Board

CONCISE SUMMARY: This rule will facilitate the proper management of fisheries. This amended rule pulls together existing rules and department procedures which have been established since the early 1990's related to fish buyers. This includes reporting requirements for the commercial purchase and sale of angler caught fish in Vermont. The rule defines spearing allowed by statute, protects trout in the Little River and Dog River by allowing catch and release only (except for children).

FOR FURTHER INFORMATION, CONTACT: Catherine Gjessing, Vermont Fish and Wildlife Department 1 National Life Drive, Davis 2 Montpelier, VT 05620-0302 Tel: 802 595-3331 Fax: 802 828-1250 E-Mail: catherine.gjessing@vermont.gov URL: http://www.vtfishandwildlife.com/about_us/fish_and_wildlife_board/board_rules .

FOR COPIES: Eric Palmer, Vermont Fish and Wildlife Department 1 National Life Drive, Davis 2 Montpelier, VT 05620-0302 Tel: 802 535-7635 Fax: 802 828-1250 E-Mail: eric.palmer@vermont.gov.

Rule on Sound Levels from Wind Generation Facilities.

Vermont Proposed Rule: 17P010

AGENCY: Public Service Board

CONCISE SUMMARY: The rule establishes a sound level limit at nearby non-participating residences that wind generation facilities must meet. In addition, the rule defines standards for how to model sound impacts during the permitting process and compliance methodologies to monitor and analyze sound level from a wind generation facility after construction.

FOR FURTHER INFORMATION, CONTACT: Thomas Knauer 112 State Street, 4th Floor Montpelier, VT 05602 Tel: 802-828-2358 Email: thomas.knauer@vermont.gov URL: https://psb.vermont.gov/about-us/statutes-and-rules/proposed-rule-sound-wind-generation-facilities.

FOR COPIES: Kevin Fink Public Service Board 112 State Street, 4th Floor, Montpelier VT 05602 Tel: 802-828-2358 Email: kevin.fink@vermont.gov.